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AUTHOR	Copa, George H.; Maurice, Clyde F.
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ABSTRACT

The purpose of this handbook is to document a procedure for obtaining information about the interest of people for additional job training. (The procedure will result in a set of tables providing information on interest in job training for use in planning educational programs. It is designed to be flexible enough for use in areas as small as school districts or as large as whole States and for use with a minimum of formal training by persons unfamiliar with survey procedures.) An introductory chapter discusses the purposes of people's need assessment. Chapter 2 discusses activities, materials, staffing and costs required for making a study. Descriptions are based on experiences in conducting studies of the same type in Steele County, Minnesota (rural), South St. Paul and Minneapolis (urban), and in Minnesota's Economic Development Region IV (regional). Chapter 3 outlines the basic procedure for drawing a sample of individuals to be contacted during the assessment study (a modification of the procedures outlined by the U.S. Bureau of Census in its Current Population Survey). In chapter 4 the procedure for contacting households and coding questionnaire responses is explained. Chapter 5, on analysis and summary of collected data, provides an explanation of the summary tables which result from the analysis of returned questionnaires. A summary of the procedures is appended along with a sample questionnaire, an index for hobby and special interest programs, and other aids. (JT)

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People's Need for Additional Job Training: Procedure for Assessment

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George H. Copa
Clyde F. Maurice

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CE 009 431

Minnesota Research Coordinating Unit
for Vocational Education
Department of Vocational and Technical Education
University of Minnesota
Minneapolis, Minnesota 55455

November 1976

PREFACE

The procedure described in this report is designed to collect information on the perceived needs of people for additional job training. It is flexible enough to be used in areas as small as school districts or as large as whole states. The procedure is described in enough detail so that it can be used with a minimum of formal training by persons unfamilar with survey procedures. The purpose of the collected information is to improve the decisions made in planning, approving, and implementing job training programs by securing additional knowledge about the clients for which programs are being designed and operated.

Development of this procedure began in 1970 with deliberations among colleagues at the Minnesota Research Coordinating Unit for Vocational Education. The importance of assessing the needs of people for job training was identified as a priority at that time by the Minnesota State Advisory Council for Vocational Education, Minnesota Research and Development Review Committee for Vocational Education and the Division of Vocational and Technical Education in the Minnesota State Department of Education. The first step was to develop a framework for defining "people's need for job training" and later, develop and test means of collecting the needed information. Testing was done in a rural area with various size population centers -- Steele County, Minnesota. The result of this effort was a report entitled, "Individual Demand for Vocational Education: Structure and Determination" authored by George Copa, Edgar Persons, and Paul Thomas.

The next contributing effort in assessing the needs of people for job training was a study conducted by Paul Thomas as his dissertation at the University of Minnesota under the advice of Edgar Persons. In this study, the procedure was adapted for a metropolitan area, South St. Paul, and modifications were made to the questionnaire format. Information collected was used in planning the vocational education programs to be offered at the then new Dakota County Area Vocational Technical Institute.

The third major effort in assessing people's need for additional job training was conducted in 1974 as a joint project of the Minneapolis Public School District and the Minnesota Research Coordinating Unit for Vocational Education. The purpose of the effort was to provide information of use in justifying and planning a new proposed Minneapolis Area Vocational Technical Institute. A random sample of 5,000 households was contacted in the City of Minneapolis as well as a sample of seniors from each of Minneapolis' High Schools. In this study, the questionnaire was further refined and a specific data collection procedure adopted. The result was a report entitled, "A Study to Assess Minneapolis Residents' Perceived Needs for Job Training". It was presented to the Minneapolis School Board and later to the residents of Minneapolis as they considered a bond issue to raise money for the proposed new Institute.

In another assessment effort, the people's need questionnaire was administered with minor revisions to all tenth and eleventh graders in the Anoka Public School system. Information collected was used as one part of a planning strategy for secondary vocational education programs in the Anoka schools.

The latest assessment effort resulting in the writing of this report was conducted in Minnesota's Economic Development Region IV with support from the Governor's Manpower Office in Minnesota. This effort provided an opportunity to test the procedure in a large, multi-county rural area. A sample of approximately 3,600 households was contacted in Region IV along with a sample of high school seniors from each county in the Region.

The procedure described in this report is based on the experience gained through the efforts described above. Experience with the procedure has been in both rural and urban areas and with individuals ranging in age from grade ten to well past the age of 65. Initial support for developing the procedure was provided by the Division of Vocational Technical Education in the Minnesota State Department of Education and the Department of Vocational and Technical Education at the University of Minnesota. Later, additional support was provided by individual school districts who used the procedure, and most recently, by the Governor's Manpower Office in Minnesota.

Many individuals have contributed to the people's need assessment procedure described in this report. Not all can be named but special acknowledgement is due the following persons: Jerome Moss, Jr., Brandon Smith, Edgar Persons, and Donald Irvin -- colleagues at the University of Minnesota; Paul Thomas and Kathy Novak -- members of the research staff on past efforts; Paul Mueller -- project director in the Minneapolis study; Gen Olson -- project director in the Anoka study; and John Sem, Bill Scharff, and Karen Peterson -- project staff in the Economic Region IV study. Special acknowledgement is due the Governor's Manpower Office in Minnesota for supporting the printing and distribution of this report.

The authors hope that the procedure described will be used where needed and modified as necessary to meet individual situations toward the end of improving the educational programs available to the people.

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CHAPTER I

PURPOSE OF PEOPLE'S NEED ASSESSMENT

Those responsible for providing educational programs designed to prepare people for work face the typical questions of what, how much, when, and where. In answering these questions, they consider past experiences and resort to "best guesses" about the future. Consideration is given to what "could" be done and what "should" be done, but eventually they must decide what "will" be done. Many factors enter the decision making process such as: (1) what are the demands of industry for trained workers, (2) what are the interests of people for job training, (3) what are the types of training programs which can be provided legally by particular funding agencies (e.g., states under federal vocational education legislation, prime sponsors under the Comprehensive Employment and Training Act), (4) what training programs can be provided more effectively than from alternative sources, (5) what is the quality of the training program which can be offered, (6) how accessible is the training program in terms of providing equal opportunity, and (7) is the training program efficient.

The purpose of this handbook is to document a procedure for obtaining information about one of these factors -- the interests of people for job training. The importance of this factor stems from it being the "wishes of the consumer" in the market place for educational services. It is information about the perceived needs of the buyer of job training services. It is only one of several types of information which enters the educational decision making process; but it is information which cannot be ignored in a quest for relevance, use (i.e., enrollment), and comprehensiveness of services.

MAJOR QUESTIONS

What are the major dimensions or ways of characterizing the perceived needs of people for job training? The answer should relate to how the information will be used. A major dicotomy in use appears to be in deciding what job training services are needed, and in deciding how the services are to be offered.

Deciding what services are needed requires information about why the training is needed (e.g., to prepare for a first job, to prepare for job advancement or promotion); what type of training is desired (e.g., secretarial, welding, agricultural production); and how many individuals want the training. The importance of the first two categories of information rests on the assumption and general practice that different training programs are indeed needed and can be designed and offered for individuals with different combinations of responses to the "why" and "what type" questions. For example, the program to prepare individuals for a first job as a secretary is usually different from a program to prepare individuals to be promoted or advanced to be a secretary. The difference is not always in content, but may be in length, depth, or mode of delivery. The question of how many want the service has direct implications for the priority of the program relative to other programs.

The question of how to deliver job training services prompts questions about when training can be attended, where can training be attended, what are the special barriers to attendance, and other characteristics of the consumer such as age and employment status. Answers to when training can be attended (e.g., days, nights, weekends) have implications for when services should be scheduled so as to be widely accessible. Information about where programs can be attended can be determined from responses to questions of present location and the distance prospective enrollees are willing to travel. Knowledge of special barriers to participating in job training services is particularily useful in deciding how or under what conditions services will be offered. Barriers may involve concerns such as lack of child care and transportation services, insufficient resources to pay tuition, or inadequate knowledge of what programs are available. These concerns may imply the need for services beyond job training such as child care, transportation facilities, counseling and guidance services, and financial assistance. Without these additional services the programs are really not accessible to some people for reasons beyond their own control.

In summary, the major questions to be answered about the perceived needs of people for additional job training in making decisions about educational programs to meet these needs are:

1. Why is training needed (e.g., prepare for first job)?

2. What type of training is needed (e.g., welding)?

3. How many want the training?

4. When could training be attended?

5. Where could training be attended?

6. What are special barriers to attendance?

7. What are the characteristics of people to be served (e.g., age, employment status)?

These questions form the basis for determining what information is to be collected in the procedure explained in this handbook.

USERS AND USES OF INFORMATION

Three major uses of information on the perceived needs of people for job training are in the functions of planning, approving, and implementing job training programs. These functions are often carried out by different groups of individuals. Planners can use the information in defining the full array of alternative programs which are needed. Further, they can use the information in defining the alternative programs (e.g., what are the characteristics of a "program", how are the needs sub-divided into mutually exclusive and exhausive parts). Planners must define programs in order to array them and estimate how the program can be accomplished and how much it will cost. As already mentioned, the information about perceived needs can be used in deciding "how" to deliver the program and, thereby, in estimating its likely cost. Information on how many want the program also has implications for cost. The planners, as thought of here, are those who staff state departments of education, prime sponsor agencies, economic development commissions, and administrators in local educational agencies (e.g., area vocational technical institutes, secondary schools, community colleges, universities).

The second group of users is those who function to approve job training programs. They use the information to set priorities among the array of alternative programs. In this function, priorities are weighed against resources and "go/no go" decisions are made. The information on perceived needs of people for various programs can be used as indicators of relevance and potential utilization. The approvers are concerned with the "value" of the program and its cost. Several factors are important in determining "value", and one is the "acceptance" of the program by those who are to benefit from it. Perceived needs of potential consumers can be used as a measure of acceptance. The "approvers" are those who are members of the legislative, executive, and judicial branches of government; and members of school boards, college and university boards, state boards, and economic development commissions.

The third group of users are those who function to implement job training services. Their job is to decide specifically how the programs are to be operated and be active in their operation and management. The decision of how to implement is uniquely characteristic to each different situation in terms of time, place, and the individuals involved. "Implementers" can use the information in deciding how to make the programs accessible and relevant to potential participants. The concern is with selecting the right time, place, subject matter, and instructor. Perhaps the use of the information on perceived needs of people for additional job training is more tenuous for this function than for the two previously described. The reason is not that the information itself is of less use but that there are many other types of information which may be equally important (e.g., what facilities are available, quality of instructor available, how many students will actually show up, fit with programs offered in the recent past). The "implementers" are usually the instructors and their immediate superiors (e.g., department heads in educational institutions, directors of continuing education programs).

LIMITATIONS OF INFORMATION

Before going further, the information on the perceived needs of people for additional job training must be put in perspective. The following list of limitations is intended as "consumer protection information" for those contemplating the use of the procedures described in this handbook:

1. The information provided is a self-perception of need; it depends on the current knowledge and understanding of the respondent concerning his need for additional job training, the specific type of job training of interest, and the benefits to be obtained by attending a training program.

2. The intensity of perceived need is a measure of expected utility for which there is no common scale which can be applied uniformly to and by each respondent. Only ordinal measurement and analysis are possible without major assumptions.

3. The need as previously stated, is only perceived. Certainly, there may be individuals in the population who "need" job training but do not recognize this need for one of several reasons (e.g., don't know the benefit, are not aware of their problem).

4. Perceived need is a measure of interest in a particular kind of additional job training and does not mean that the individual would always actually enroll or attend if the program were offered.

5. The procedure advocated involves a sample of the population of an area at a given time of year in a particular year. Depending on sample size relative to population size and the completeness of response, an error of estimate is expected. Also, relative to time of measurement, variations are expected in perceived needs depending on season and year.

6. The information on perceived needs of people is most useful in conjunction with other equally important information (e.g., demands of industry, program efficiency, program quality). If this other information is not available at the same time, the usefulness of the perceived need for job training may be hampered.

Where possible, the procedures which follow have been designed to minimize these limitations -- but nevertheless, they continue to exist in some degree.

CHAPTER II

ACTIVITIES, MATERIALS, STAFFING, AND COST

Conducting a study to assess people's need for additional job training requires considerable planning and coordination. This chapter will describe the major activities in doing the study as well as the resources required. These descriptions are based on experiences in conducting studies of this type in Steele County, Minnesota; South St. Paul and Minneapolis, Minnesota; and Minnesota's Economic Development Region IV.[1]

The major activities which have to be planned and carried out are:

1. Secure commitment and resources for assessment.
2. Hire local project director and secretarial assistance.
3. Secure space and equipment for project.
4. Train staff in use of the assessment procedure.
5. Plan assessment study.

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[1] See the following publications for a description of each study, respectively:

Copa, George, Persons, Edgar and Thomas, Paul. Individual Demand for Vocational Education: Structure and Determination. Minnesota Research Coordinating Unit for Vocational Education, University of Minnesota: Minneapolis, February, 1973.

Thomas, Paul. Method to Determine the Vocational Education Needs of Adults in South St. Paul, Minnesota. Ed.D. Dissertation, University of Minnesota: Minneapolis, 1974.

Minneapolis Public Schools and Minnesota Research Coordinating Unit for Vocational Education. A Study to Assess Minneapolis Residents Perceived Needs for Job Training. Minneapolis Public Schools: Minneapolis, 1974.

Copa, George and Maurice, Clyde. People's Need for Additional Job Training: Development and Evaluation of an Assessment Procedure. Minnesota Research Coordinating Unit for Vocational Education, University of Minnesota: Minneapolis, October, 1976.

6. Conduct public relations efforts.

7. Define population to be assessed.

8. Select sample of population.

9. Review and print questionnaires and cover letters.

10. Collect data.

11. Code collected data.

12. Analyze data.

13. Write report of assessment.

14. Disseminate assessment report.

Each of these activities will now be described. Because activities 8, 9, 10, 11, and 12 require lengthy descriptions, they are covered in separate chapters of this handbook and, therefore, will be only briefly treated in this chapter.

SECURE COMMITMENT AND RESOURCES

Administrative commitment for the assessment should be based on the uses of the information as presented in Chapter I. The assessment might be commissioned by the planners, approvers, or implementers of job training programs. In any case, all three groups should be brought together to make them aware of the assessment, and solicit their suggestions and support; this activity will pay off later when the assessment is completed and use of the information is a concern.

Commitment to do the assessment is usually indicated by the allocation of funds to do the study. The amount of funds required depends on several factors such as: (1) size of population to be assessed, (2) needed accuracy of assessment, (3) density of population (i.e., urban versus rural), and (4) availability of resource materials. In general, the major factor is the number of households to be surveyed (i.e., sample size). Past studies have indicated that the cost is likely to average about three dollars per household surveyed. Therefore, if 3,000 households were included in the sample, the cost of the assessment would be approximately nine thousand dollars. However, as mentioned above, several factors may influence this cost one way or another. Estimates of the costs of various resources needed in the study are shown in Table 1; these estimates are only for guideline purposes and will vary somewhat from one location and situation to another.

TABLE 1

COST REQUIREMENTS PER HOUSEHOLD FOR HOUSEHOLD SURVEY

RESOURCE TYPE	COST PER HOUSEHOLD
Supplies (folder, labels, binders, etc.)	$ .25
Postage (stamps, envelopes, etc.)	.41
Personnel (director, clerical, assistants)	2.03
Telephone	.24
TOTAL	$2.93

Note: Costs taken from study in Minnesota's Economic Development Region IV.

HIRE PROJECT DIRECTOR AND SECRETARIAL ASSISTANCE

A large share of the costs of the assessment will be for staff. These individuals will be the key to success of the survey; care should be exercised in their selection. It is important to secure individuals who are knowledgeable of the geographic area to be surveyed and flexible in the use of their time. A sample job description for the project director and secretarial assistance giving job duties and qualifications is provided in Exhibit 1 and 2. Project staff must be given responsibility for conduct of the assessment and must be held accountable for following suggested procedures and meeting the time schedules. Regularly scheduled meetings between the project director and the immediate supervisor are an important aspect of monitoring the project and keeping communication channels open. The secretarial assistant should report to, and be assigned duties by the project director. It may be feasible to hire temporary additional secretarial help during peak periods of project activity such as addressing envelopes and preparing for mailings.

SECURE SPACE AND EQUIPMENT FOR PROJECT

Project activities will require several types of facilities and equipment normally found in business offices. Staff should be provided office space, desks, filing space, typewriting, and other standard office supplies. In addition, because several large mailings will be conducted and many telephone calls required, the staff should have their own telephone line and access to space for preparing mailings. Space must also be provided for storing considerable numbers of questionnaires, envelopes, letters, maps, and reference resource materials.

TRAIN STAFF IN USE OF ASSESSMENT PROCEDURE

Specific procedures have been developed and tested to conduct the assessment in an effective and efficient manner. Based on past experience, it is essential that guidelines be followed explicitly. This handbook describes the procedures to be followed in conducting the assessment. In addition, consultation with and attendance at workshops provided by staff of the Minnesota Research Coordinating Unit for Vocational Education will assist in developing specialized competence in conducting the assessment study. Conferring with other individuals who have directed a study of this kind in the past may also prove helpful.

ADMINISTER ASSESSMENT STUDY

If the needs study is to run smoothly, it must be planned and directed efficiently. After reviewing each of the major activities and receiving training on the assessment procedure, a detailed plan of operation should be formulated. The plan should define activities to be undertaken, determine when they should start, determine deadlines for completion, and identify person(s) responsible for carrying out the activities.

The plan will serve to keep the study on schedule and make it a more manageable task. The time estimate for various activities as shown in Table 2 may to helpful in setting a time schedule.

EXHIBIT I

JOB DESCRIPTION FOR SITE DIRECTOR

POSITION: Site Director, People's Need for Additional Job Training Project.

JOB DUTIES:

1. Responsible for overall planning and operation of the study at the pilot site.
2. Inform the public of concern about the when, where, and why of the study.
3. Communicate the purpose of the study to key individuals in the area (e.g., school boards, government officials, teachers, advisory committees).
4. Identify individuals and obtain directories that will be helpful in securing the names and addresses of individuals in the sample.
5. Secure detailed recent maps of the geographic area to be studied.
6. Organize office personnel and equipment to carry out sample selection, questionnaire mailing and collection, and questionnaire coding and preparation for computer analysis.

QUALIFICATIONS REQUIRED:

1. Knowledgeable of area (e.g., people, organizations, geography).
2. Experience in supervising and conducting surveys.
3. Ability to plan and follow-through on details.
4. Ability to communicate and represent the project with key area people and organizations.

EXHIBIT 2

JOB DESCRIPTION FOR SECRETARIAL ASSISTANCE

POSITION: Secretary, People's Need for Additional Job Training Project

JOB DUTIES:

1. Type correspondence and communcations for project.
2. Select sample and obtain addresses.
3. Set up and maintain filing system for project.
4. Code, prepare, and mail questionnaires.
5. Follow-up non-respondents with mailings and telephone calls.
6. Code returned questionnaires.

JOB QUALIFICATIONS:

1. Ability to type and file.
2. Communication skills on telephone.
3. Accurate and persistent in attention to procedures.
4. Knowledgeable of area (e.g., people, organizations, geography).
5. Able to work late afternoons, evenings and weekends when necessary.

TABLE 2

TIME ESTIMATE FOR VARIOUS ACTIVITIES

ACTIVITY	TIME PER HOUSEHOLD (MINUTES)
Public Relations	.33
Training	.20
Identify Sample Segment	.96
Find Household Names & Addresses	2.74
Type address stickers	1.25
Coding-premail	1.08
Coding-keypunch	.47
Telephoning non-respondents	2.35
Mailing (applying stickers and stamps, stuff, etc.)	5.10
Administrative (organize staff, solve problems, locate documents, etc.)	2.85
TOTAL	16.42

Note: Time estimates taken from studing in Minnesota's Economic Development Region IV.

CONDUCT PUBLIC RELATIONS EFFORTS

Public relations efforts have at least two purposes. First, as a means of enhancing their cooperation, the population which will be contacted during the study needs to be made aware of the purpose of the study. Second, potential users of the study results must, at the same time, be made aware of the study so that they can begin to plan how they can use the data and give support for the study. This will also serve to enhance cooperation and more complete responses.

Public relation activities should involve contacting key persons or agencies (e.g., administrators of secondary and post secondary schools; organizations -- PTA, Chamber of Commerce;

governmental personnel -- mayors, county commissioners) and preparing newspaper and radio news releases. The community must be informed about the assessment study both before and during the study. Public relations activities should be scheduled so as to provide maximum contribution to the success of the study. In general, public relations activities will be a major responsibility of the project director.

DEFINE POPULATION TO BE ASSESSED

The "population" is the group of individuals about which information on perceived need for additional job training services is to be obtained. The instrument for data collection, described in a latter section, was designed for use with anyone of high school age and over with normal reading abilities. To date it has been used with tenth and eleventh graders as well as adults well past the age of 65.

It is suggested that data be collected on broadly defined populations in order to keep data on smaller subsets of the population (e.g., age groups, sex groups, groups with particular interests) in perspective for planning purposes. Essentially, definition of the population will depend on the purpose of the study, the geographic area to which generalizations will be made, and the amount of resources available to conduct the assessment. If convenient, the population should be defined in terms of existing geographic location boundaries (e.g., school districts, counties) so that other data (e.g., Census of Population, County Business Patterns) is conveniently available about the population in question.

SELECT SAMPLE OF POPULATION

While there are several methods of sampling that might provide good representation of the population, a method that appears to be least costly in both time and money is one based on the geographic location of households. It involves a random sampling of sampling units consisting of about six households each. The major advantages of this method of sampling are: (1) much of the work in identifying the sample can be done in an office by secretarial personnel, (2) everyone must live somewhere, thus, the "household" allows potential contact with everyone in the population, and (3) the general procedure has been documented and used successfully for other purposes for some time by the Current Population Surveys of the Bureau of the Census. The sampling process is described in detail in a later chapter of this report.

The proposed sampling procedure is most appropriate if used when sampling adults in a particular geographic area. If information is wanted only from individuals in the last years of high school or post-secondary schools, it may be more appropriate to collect information from everyone meeting these criteria by administering the questionnaire in school.

Another important aspect of the sampling question is to determine the sample size needed. The solution to this problem is based on many factors, of which only a few of the most important will be dealt with here.[2] In discussing these factors, it is assumed that the estimate being made is the proportion of persons in the population who fit a particular category (e.g., the proportion of persons in the population interested in enrolling in an auto mechanics program). It is also assumed that the sampling method is a simple random sample.

With these assumptions in mind, the factors important to the sampling question considered here are (1) desired accuracy in the estimate, (2) the expected proportion of persons in a category before doing the study, (3) resources available to conduct the study, and (4) the population size.

With unlimited resources, one can get 100 percent accuracy by making the sample the same size as the population. However, unlimited resources are not the usual case, so this alternative can be ignored except when the population is relatively small and easily accessible (e.g., all students in a particular school).

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[2] For more detailed study, there are several books and publications which deal with this topic. Some examples are:

Walker, Helen M. and Joseph Lev. Statistical Inference, Holt, Rinehart, and Winston: New York, 1953.

Slonim, Morris James. Sampling, Simon and Schuster: New York, 1967.

Kish, Leslie, Survey Sampling, John Wiley and Sons, Inc.: New York, 1965.

When resources are limited and the population large, a sample of some size less than the population must be considered.

With some resource flexibility, it is logical to start by deciding upon the accuracy necessary to result in valid information for the purposes intended. This approach brings into play the trade-off between accuracy of information and the amount of resources required to obtain the information. Generally, the more accurate one wants to be, the larger the sample required, and, therefore, the higher the costs.

As an example, assume that the population size for the geographic area studied is 20,000 persons. If one is concerned about estimating the proportion of persons interested in an auto mechanics program, and if existing information leads one to believe that approximately one percent of the population may be interested, then the sample size required for various degrees of accuracy are as presented in Table 3.

TABLE 3

ESTIMATING SAMPLE SIZE GIVEN AN ALLOWABLE ERROR IN INCIDENCE OF OCCURANCE

Allowable Error[a]	Sample Size
200	270
100	1,022
50	3,548
10	16,894

Note: Allowable error should be interpreted to mean that the estimated population value obtained from the sample plus or minus the number listed in this column would include the true population value in 90 out of 100 samples.

Table 3 shows that if one wants his estimate of the number of persons interested in auto mechanics to be within 100 persons of the actual number interested in the population in 90 samples out of 100, then he must randomly sample 1022 persons. If the estimate is to be within 10 persons, he must sample 16,894 persons. As can be seen, as desired accuracy increases, sample size must increase, other things remaining the same.

In the above example, it was estimated before sampling, that one percent of the population was interested in auto mechanics program. The size of the sample required to maintain a certain level of allowable error is dependent upon the size of this prior estimate.

Another relationship which is important to consider in sampling is that sample size is not very dependent on population size when the population is relatively large. For example, if we assume from our previous example that one percent of the population is interested in auto mechanics and we allow an error of 50 persons in 90 samples out of 100, then the sample size required for various size populations is as shown in Table 4.

TABLE 4

ESTIMATING SAMPLE SIZE FOR
VARIOUS SIZE POPULATIONS

Population Size	Sample Size Required	Percent Sample of Population
200	191	95%
500	448	90%
1,000	811	81%
2,000	1,366	68%
5,000	2,316	46%
10,000	3,014	30%
20,000	3,548	13%
50,000	3,971	8%
100,000	4,135	4%

Note that the sample size increases very little after the population reaches 20,000 under the pre-set conditions. This relationship is important to keep in mind when estimating cost of information collection for a large and small population - the sample size required to insure a constant level of accuracy does not increase in direct proportion to increased population size.

In order to give some specific guidance on selection of sample size, Table 5 is provided to show the sample size required

TABLE 5

ESTIMATION OF SAMPLE SIZE REQUIRED WITH AN ERROR TOLERANCE OF PLUS OR MINUS 20 PERCENT OF THE ESTIMATE IN 95 OUT OF 100 SAMPLES

Population Size	Size of Sample Needed if Expected Percentage of Occurrence Is							
	.25%	.50%	1%	5%	10%	20%	30%	40%
200	--	--	--	--	89	132	105	84
500	--	--	--	393	317	218	155	112
1,000	--	--	--	647	465	279	184	126
2,000	--	--	1,654	957	605	324	202	135
5,000	--	3,967	3,283	1,342	740	358	216	141
10,000	7,939	6,576	4,887	1,550	799	372	220	143
20,000	13,164	9,798	3,857	1,680	832	379	222	144
50,000	21,757	13,878	8,023	1,769	854	383	224	144
100,000	27,806	16,114	8,723	1,801	861	384	225	145

Note: It is important to recognize that the 20% error limit specified here refers to a relative rather than absolute percentage error. For example, if the percentage of occurrence is 10%, a 20% relative error limit would signify that the range of tolerance is 10% ± 20% of 10%, or 10% ± 2%. If the concern were with a 20% absolute error (i.e., 10% ± 20%) the table of sample sizes would be entirely different.

for various size populations and expected percentages of occurance in the category in question (e.g., age group, interest in auto mechanics) assuming an error tolerance of plus or minus 20 percent of the estimate in 90 out of 100 samples. As shown in Table 5, with the above assumptions, the sample size needed if it is expected that ten percent of the population will be contained in the category and the population size is 2,000 would be 605.

The problem of sample size has not been answered for every particular situation. Only some of the major factors to consider and their relationship to sample size have been discussed. The conclusion is that sample size depends on several characteristics of the situation in which a sample is to be acquired (e.g., resources available, desired accuracy, population size). Sample size can be specific only after these characteristics are made explicit.

REVIEW AND PRINT QUESTIONNAIRE AND COVER LETTER

The exact questions to be asked are dependent on the purpose of the study and somewhat on the population of individuals being assessed. The questionnaire presented here is that which was developed and used in the needs assessment study conducted in Economic Development Region IV in Minnesota.[3] It was designed to obtain information about need for more education for job preparation as well as hobbies and special interests. The sample questionnaire and its bases will be described in this section. The questionnaire can be used as is or can serve as a starting point for developing a more specialized questionnaire suited to particular purposes.

Review of Questionnaire

The questionnaire was developed to answer the questions posed in Chapter I as being important items of information about a population to be served when planning educational programs. These questions were:

1. Why is training needed (e.g., prepare for the first job)?
2. What type of training is needed (e.g., welding)?
3. How many want the training?
4. When could training be attended?
5. Where could training be attended?

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[3] *Ibid.* Copa and Maurice.

6. What are special barriers to attendance?

7. What are the characteristics of people to be served (e.g., age, employment status)?

The questionnaire will be described in sections relating to each of these questions. A complete questionnaire is shown as Appendix I.

General Characteristics of Population

Starting first with the last question which concerns general characteristics of the population, the relevant section of the questionnaire is shown as Exhibit 3. Information on general characteristics serve at least two major purposes. First, it provides information upon which to check how well the sample of respondents matches the population from which the sample was drawn. For example, using the information shown on the questionnaire in Exhibit 3, the sample of respondents can be described in terms of their age, sex, and employment status and then compared to existing data of this kind about the full population being studied. These factors are all related to likely biases the sample might have regarding the desired amount and type of further education, particularily for job preparation.

Second, the general characteristics information provides a means for subdividing the data into groups of special interest (e.g., males, age 24-30, unemployed, retired). In this way, the usefulness of the data is increased many fold for use in planning educational programs to meet the needs of specific groups of individuals. Note that for this section of the questionnaire and other sections, provisions have been made for coding of the questionnaires and direct transfer of information to key punched computer cards (i.e., see the numbered boxes on the questionnaire).

Why Training Is Needed

As shown in Exhibit 4 and 5, the questionnaire is divided into two basic sections, one dealing with interest in more education for hobbies and special interests and the other interest in more education for job training. In each case, respondents are given the opportunity to review and indicate why they

EXHIBIT 3

GENERAL CHARACTERISTICS INFORMATION

A. What is your age? ________ years (11-12)

B. What is your sex? ________ male ________ female (13)

C. If you are working at present, what is your job? ________________________________ ☐☐☐
(For example: teacher, farmer, secretary, homemaker) (14-16)

If you are not working at present or are working less time than desired, what is the reason? Check all that apply.

________ 1. In school (17)
________ 2. Retired (18)
________ 3. Cannot find more work (19)
________ 4. Do not want more work (20)
________ 5. Other reason, explain: ________________________________ (21)

EXHIBIT 4

WHY MORE EDUCATION IS OF INTEREST FOR HOBBIES OR SPECIAL INTERESTS

D. Do you want more education for hobbies or special interests for any of the following reasons? Check the one most important reason or check "do not want." ☐ (22)

________ 1. Better use of my leisure time.
________ 2. Save money by doing it myself.
________ 3. General self-improvement.
________ 4. Do not want more education for hobbies or special interests (skip question E, go to F).

EXHIBIT 5

WHY MORE EDUCATION IS OF INTEREST FOR JOB TRAINING

F. Do you want more job or employment related training for any of the following reasons? Check the one most important reason or check "do not want."

________ 1. Prepare for my first job.
________ 2. Prepare for a job which is unrelated to a job I have or have had. (29)
________ 3. Prepare to re-enter a job similar to one I had in the past. ☐
________ 4. Prepare for a job promotion or advancement.
________ 5. Prepare to do better at or keep my present job.
________ 6. Prepare for certification, recertification, or licensing.
________ 7. Do not want more job or employment related training (skip Question G, go to I).

are interested in more education. The questionnaire responses are designed to make the respondent aware of the alternative purposes of educational programs and, thereby, suggest potential benefits to the respondents. When designing educational programs, it is important to know the respondent's purpose for participating. For example, a program designed to help a person to do better or keep their present job may be very different than one designed to help a person to initially prepare for the same job. These two programs not only require differences in content, but may well be different in length, time schedule, location, cost, and entry requirements. The question of "why" is asked before the respondent is asked "what" kind of program is desired because it seems to be a logical sequence of reasoning for the respondent to go through in determining a priority of "interest" in more education.

What Type of Training Is Needed

Type of training refers to the content (e.g., for what occupation, for what hobby) of the education of interest. There are several means of approaching the task of identifying the type of program(s) of most interest to individuals. Here, interest is viewed as a proxy for "need" as judged from the individual's own perspective. Each means of identifying interest has advantages and disadvantages relative to the ease of obtaining the information and its validity and reliability. In a review of research on vocational choice, Crites[4] summarized the means which have been used to measure vocational choice and identified the interview, open-ended questions, and the questionnaire as the three most frequently used. The open-ended question, however, was judged the best measure in terms of validity and reliability. Although vocational choice is not the same as interest in more education for a particular type of occupation, hobby, or special interest, it seems reasonable that the concepts are similar in their measurement problems.

With this reasoning, the approach taken was to combine the advantage of a structured questionnaire designed to make the respondent aware of the alternatives available, with an open-ended question to obtain an indication of what specific type of training is desired. As shown in Exhibit 6 and 7, respondents are first asked to choose among a comprehensive list of types of programs for hobbies and special interests and for job training; then, within each program purpose, they are asked to indicate their first, second, and third choices. The objective of this question is to obtain a decision on priorities relative to broad types of programs; in effect, the respondent is beginning to given an indication of program interest. This procedure enables the respondent to communicate that several program types may be of interest. Secondly, the respondent is asked what specific type of program is desired for the first choice indicated. Here the question is asked in an open-ended format enabling the respondents to communicate in their own words specific and detailed interests. A combination of the first and second question is designed to maximize both validity and reliability of response, and enhance the ease with which this measure can be made.[5]

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[4] Crites, John O. Vocational Psychology. McGraw-Hill Book Company: New York, 1969, p. 570

EXHIBIT 6

PROGRAM CATEGORIES OF INTEREST FOR HOBBIES OR SPECIAL INTERESTS

E. For the reason checked in Question D above, what type of programs would you like? Indicate your first choice with a "1," your second choice with a "2," and your third choice with a "3."

______ 1. Basic skills (examples: refresher math, basic English) ☐
______ 2. Arts and crafts (examples: oil painting, art, leather tooling) (23)
______ 3. Music (examples: guitar, banjo, piano)
______ 4. Recreation (examples: camping, bridge, dancing) ☐
______ 5. Home skills (examples: quilting, flower arrangement, gourmet cooking) (24)
______ 6. Technical (examples: home remodeling, auto repair, plumbing, electrical wiring)
______ 7. Liberal (examples: history, economics, foreign language) ☐
______ 8. Other type, explain: ____________________ (25)

IMPORTANT

For the choice checked "1" in Question E above, describe in detail the actual topic you had in mind. Examples: refresher math, guitar, plumbing, history.

____________________ ☐☐☐
(26-28)

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[5] Validity and reliability estimates have been made of these questions and are reported and discussed in the publication entitled, "People's Need for Additional Training: Development and Evaluation of an Assessment Procedure" cited earlier.

EXHIBIT 7

PROGRAM CATEGORIES OF INTEREST FOR JOB OR EMPLOYMENT RELATED TRAINING

G. For the reason checked in Question F above, what are the job(s) for which you would like to better prepare? Indicate your first choice with a "1," your second choice with a "2," and your third choice with a "3."

______ 1. Agriculture (examples: farmer, tractor mechanic, feed salesperson, florist)

______ 2. Office and accounting (examples: secretary, cashier, bookkeeper, accountant, office manager)

______ 3. Communications (examples: newspaper reporter, photographer, telephone operator, radio repairperson) ☐ (30)

______ 4. Construction (examples: carpenter, electrician, painter, plumber) ☐ (31)

______ 5. Consumer homemaking (examples: homemaker, parent)

______ 6. Environment (examples: water quality technician, air pollution technician, sewage plant worker) ☐ (32)

______ 7. Entertainment (examples: musician, sound and light technician, backstage hand, actor or actress)

______ 8. Health (examples: nurse, surgical technician, nursing assistant, dental laboratory technician, doctor)

______ 9. Hospitality and recreation (examples: maid or houseman, cook, waiter or waitress, dietitian, motel manager, guide, resort worker)

______ 10. Manufacturing (examples: machinist, assembler, plant manager)

______ 11. Personal service (examples: barber or cosmetologist, child care worker, tailor, seamstress)

______ 12. Public service (examples: police staff, teacher, safety inspector, social service worker)

______ 13. Transportation (examples: truck driver, auto mechanic, service station manager, stewardess, pilot)

______ 14. Sales and marketing (examples: salesperson, advertising specialist, merchant, appraiser)

______ 15. Other, explain ______________________________

IMPORTANT

For the group of jobs checked "1" in Question G, describe in detail the actual job you had in mind for which more training is desired. Examples: secretary, carpenter, farmer, registered nurse.

____ ☐☐☐

____ (33-35)

The broad types of programs listed in the first question of the section on type of program of interest as shown in Exhibit 6 and 7 were developed by reviewing existing lists of educational programs and categories of program content (e.g., occupational categories). Resources which were reviewed included schools' educational program catalogs, U.S. Office of Education career education clusters, U.S. Office of Education taxonomy of vocational educational programs, Minnesota Higher

Education Coordinating Board program taxonomy, U.S. Census of Population list of occupations and industries, and the Dictionary of Occupational Titles. The broad educational program categories were then subject to review by educational and other staff personnel located within the geographic areas where past studies of this kind have been made. In addition, for each set of program categories, a category entitled "other" is included to make sure that the respondent has some place to respond if the listed categories appear inappropriate. For each broad program category, examples of types of specific programs are illustrated in order to give meaning to the broad program category labels.

How Many Want Training

The answer to the question of how many want training is designed to be obtained from responses to questions about purpose of training as shown in Exhibit 2 and 3. All responses to the choices other than "do not want more education" are considered to be indications of interest in more education. Indications of how many want more education for a particular purpose and in a particular type of program can be obtained by observing the frequency of responses in other sections of the questionnaire (see Exhibit 2-7).

When Could Training Be Attended

The question designed to obtain an indication of "when" programs could be conveniently attended is shown in Exhibit 8. Respondents are asked to respond to all alternative times during which they could attend an educational program. The categories are designed to represent broad alternatives which are possible for educational agencies or organizations.

EXHIBIT 8

WHEN COULD MORE EDUCATION BE ATTENDED

H. When could you attend an educational program? Check as many as you can

______ 1. Day (Monday-Friday) (36)

______ 2. Night (Monday-Friday) (37)

______ 3. Weekends (38)

What Are Special Barriers To Attendance

In an effort to obtain information of particular use in the planning of "how" programs will be implemented, respondents are asked to indicate serious problems or barriers that may hinder their attendance to educational programs (see Exhibit 9). The list of problems was developed by a review of other studies of this kind, discussions with groups of educational personnel, and responses to this question on previous assessment studies. Again, an "other" category is included for responses which do not appear to fit the listed categories.

EXHIBIT 9

PROBLEMS TO ATTENDING MORE EDUCATION

I. What are some of the most serious problems that may prevent you from attending an educational program? Check all that usually apply to you.

_____ 1. Program not available in local area. (39)
How far would you travel? _____ miles (40-42)

_____ 2. Program not available at convenient time. (43)

_____ 3. Could not meet admission requirements. (44)

_____ 4. Costs of attending are too high. (45)

_____ 5. Present job does not allow time. (46)

_____ 6. Family obligations (e.g., child care) do not allow time. (47)

_____ 7. More training would not raise my income. (48)

_____ 8. Have no transportation. (49)

_____ 9. I never hear about programs being offered and I don't know where to find out. (50)

_____ 10. Other, explain: _____ (51)

J. Would you like help in deciding what type of further education or job training you need? (52)

_____ yes _____ no

Thank you for your responses. Did other members of your household fill out their form? Please fold and return all the forms from your household in the enclosed envelope. No postage is required.

Another problem respondents may have is trying to decide what type of further education they really need. For this purpose, an additional question is included at the end of the questions shown in Exhibit 9 to obtain an indication of how many want help in making their decisions about further education.

Where Could Training Be Attended

In order to obtain information on "where" training could be attended, two items of information are included on the questionnaire. The first is a code for the specific geographic location of the respondent's household. The location is specific enough to identify which block within a city and township within a rural area. It can also be aggregated more broadly in terms of city and county. This code is contained in the boxes at the upper left hand corner of the questionnaire (see Appendix I), and is placed on the questionnaire at the time the questionnaire is prepared for mailing.

The second item of information on the questionnaire relating to "where" programs could be attended is shown in Exhibit 9 and asks the question "How far would you travel" as an addition to the distance barrier. Combining these two items of information, where the respondent lives and how far they are willing to travel, provides an indication of where programs can be conveniently attended.

Summary

A brief explanation of a sample questionnaire format developed through reviews of and experiences with past assessments of need for additional education has been provided. In conducting a need assessment study, the sample questionnaire could be used as is or might serve as a prototype questionnaire which could be modified to meet particular purposes and situations. If the questionnaire is used as is, existing computer programs can be used to analyze and summarize the collected data; where modifications are made in the questionnaire, existing computer programs may have to be modified or an entirely different program must be developed. When questionnaire modifications are made, some of the basic questions still need to be addressed (e.g., what purpose, what type of program is needed, when could programs be conveniently attended) and some of the formats for the questions (e.g., structured and open-ended) may be similar. Most frequent changes will probably be in the options or categories used as responses to questions (e.g., educational program categories, problem categories).

Printing Questionnaire and Cover Letter

Three points are important in preparing the questionnaire and cover letters after the final format of the questionnaire has been decided and the group to be sampled has been identified. The "cover letter" is the letter which will be sent with the questionnaire to explain its purpose and give directions for its completion. First, the process of getting the printing done must be started soon enough to secure questionnaires and cover letters with enough advance time to code them before mailing is to be initiated. Second, quality printing is essential. Both questionnaire and cover letter should be prepared by "offset" printing. Before printing, a check should be made that the questionnaire is amenable to coding and key punching if the data is to be computer analyzed; a little effort to make this check will save much time and resources later. The third point is preparing a sufficient number of both questionnaires and cover letters. More specific directions for this aspect of printing are covered in a later chapter of this report. As a note of caution, questionnaires and cover letters should be given a final proof by several persons before final multiple copies are produced.

COLLECT DATA

After evaluating several different methods of collecting assessment data of this kind,[6] it is recommended that the procedure of two mailings with a follow-up telephone call be used to collect the data. This procedure has proven to be the most effective in getting returns for the cost incurred.

Data collection will involve preparing a first mailing of the questionnaires and cover letters to all the households in the sample, a second mailing of the same questionnaires and a new cover letter to non-respondents, and a telephone call reminder to the remaining non-respondents. During data collection, access to facilities to prepare and post the mailing, handle in-coming mail, and make telephone calls is essential. Most of the data collection efforts can be done by secretarial staff after they have received training in the assessment procedures.

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[6] Ibid., Copa, Persons, and Thomas, p. 50-56. Eleven different methods of collecting need assessment information were tested; methods involved direct mailing, mailing with incentive, telephone, and personal interview.

CODE COLLECTED DATA

As questionnaires are returned, they must be coded for either hand or computer analysis. Again this activity is described in more detail later. Essential aspects of coding are that it be done accurately and consistently. During coding, a check should be made of the completeness of the questionnaire response. In some cases is may be necessary to re-contact respondents for more complete information. Coding is straight forward except for the section of the questionnaire requiring coding of the specific type of program of interest to respondents (see the last question in Exhibit 6 and 7). Here a judgement must be made. A dictionary of occupations and industries prepared by the U.S. Bureau of the Census makes the job of coding the type of program for job training fairly routine.[7] A similar, but less comprehensive index for hobby and special interest programs is included in Appendix II of this report. An accurate job of coding will greatly facilitate later data analysis activites.

ANALYZE DATA

Analysis of the data involves the summary of questionnaire responses into some meaningful tables based on the purpose of the assessment. Although analysis can be done by hand, usually computer analysis is more efficient if there are over 100 questionnaires. A computer program for the questionnaire described in this chapter has been developed and is available at the St. Paul Campus Computing Center, University of Minnesota. The computer analysis includes key punching the data directly from the questionnaire to computer cards, editing of the data cards to detect missing or inaccurate data and summary of the data into a set of predefined tables. Tables can be prepared for the full group of respondents or selected subsets (e.g., age groups, sex, program desired). Although only descriptive analysis of the data is suggested here, more vigorous analysis involving inferential statistics may be appropriate in some situations.

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[7] U.S. Bureau of the Census. Alphabetic Index of Industries and Occupations, 1970 Census of Population. U.S. Government Printing Office: Washington, D.C., June, 1971.

WRITE REPORT OF ASSESSMENT

In order for the study to have full impact and be correctly interpreted, a complete report must be prepared. This report should describe the purpose of the study, the population and sample, the data collection instruments and procedures, the summary tables, and most important, a set of interpretations of the summary data. The report should be tailored for the audience which will be receiving it. This more complete report should serve as a base document from which briefer and more focused reports or oral presentations might be made. The "interpretation" section should describe answers, based on the data collected, to questions posed in Chapter I of this report under "purpose" of the assessment. Interpretation may include both conclusions and recommendations depending on the purpose of the assessment study. Care must be taken in making interpretation so as to avoid statements which are not warranted based on the data alone.

DISSEMINATE REPORT OF ASSESSMENT

Dissemination involves getting the results of the assessment to people who will benefit from knowing about the results (e.g., decision makers) in a form which is convenient and effective. Dissemination decisions will involve questions of how many reports to produce, how will it be done, who will do it, who will make presentations, to whom should oral presentations be given, and should a radio and newspaper release be prepared.

SUMMARY

Major activities in conducting an assessment of perceived needs of people for more education have been described in this chapter. Each of the activities contributes to successful completion of the study. The remaining chapters of this report provide a more detailed discussion of selected activities.

CHAPTER III

SAMPLING PROCEDURE

To ideally determine what educational needs exist in a community, it may be best to elicit pertinent information from all the residents of that community. The end result, though quite expensive and time consuming, would provide educational planners with a true indication of the educational programs which are desired by the public they serve. In most cases, however, limited financial resources and the limited time available prevent obtaining information from the total population. It then becomes necessary to select part of the population in such a manner that the part or sample selected truly represents the total population. This sample, if well selected, can provide information equally suited for planning educational programs.

The purpose of this chapter is to outline the basic procedure for drawing a sample of individuals to be contacted during the assessment study. The procedure used is a modification of the procedure outlined by the United States Bureau of Census in its Current Population Survey.[8] The outcome is the selection of a random sample of households complete with the addresses used to initiate contact with household members.

Since the Census Bureau bases its boundries on a rural-urban criteria for data reporting purposes, and since population density determines the placement of geographic boundries and the presentation of census data, it is necessary to differentiate between two types of areas for sample selection. Metropolitan areas have a minimum population of 50,000 and a density of at least 150 persons per square mile while rural areas are made up of two types of sub-areas. First there are scattered population centers which are referred to as "places" and for which special maps - place maps - are provided by the Census Bureau. Second, there are low population density areas (e.g., farm land, recreation areas). Because the base population data for these two different types of areas are presented by the Census Bureau in different tables, the sample selection procedure will be specific to metropolitan areas and rural areas.

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[8] U.S. Bureau of the Census, The Current Population Survey - A Report on Methodology. Technical Paper No. 7, U.S. Government Printing Office: Washington, D.C., 1963.

Census data provides information for each Enumeration District (ED) in rural areas or Census Tract (CT) in metropolitan areas. An ED or CT can be defined as a distinct geographic area, such as a township, or as a geographic area containing a given number of people within a defined boundry. The households within these boundries form the base from which the sample will be selected using the procedure described in this chapter. Following is an outline of the procedure.

LIST GEOGRAPHIC SUB-DIVISIONS

Given that a geographic area has been selected for the study, the first step is to identify sub-divisions of the geographic area as defined by the Census of Population. The geographic area may be part of a county (e.g., school district, city), a whole county, several counties, or a whole state. The major sub-divisions used by the Census were identified earlier as the Enumeration District (for rural areas) and the Census Tract (for metropolitan areas). The purpose of this step in the procedure is to identify the respective sub-divisions in the geographic area to be studied and then to list these sub-divisions in descending order by population. The listing produced will eventually be used to draw a small sample of households which is representative of all of the households in the full geographic area. Most steps in the sampling procedure will require different procedures for rural and metropolitan areas; therefore; where relevant, they are discussed separately under each step. Base information on the population size and number of households in various Census sub-divisions of a geographic area are available from the Bureau of the Census,[9] or in the case of Minnesota, from the Minnesota Analysis and Planning System (MAPS) located at the University of Minnesota.

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[9] U.S. Bureau of the Census. 1970 Census of Housing. U.S. Government Printing Office: Washington, D.C., August, 1971.

Rural Areas

In rural areas, listing the ED's in descending order by population will suffice since ED's will also be included for the densely settled population centers (places) within each rural area. It should be noted, however, that some of these population centers may have several ED's listed with the same name. Exhibit 10 shows the 35 ED's in Steele County, Minnesota, with 16 of those ED's located in the city of Owatonna. Exhibit 11 shows the listing of the 35 ED's with the corresponding name, identification code, population count, and housing count as obtained from MAPS. All four of these items of information should be obtained about each ED. Note that ED's 7 through 25 are located in the City of Owatonna. The listing of ED's in descending order by population is shown in Exhibit 12.

Metropolitan Areas

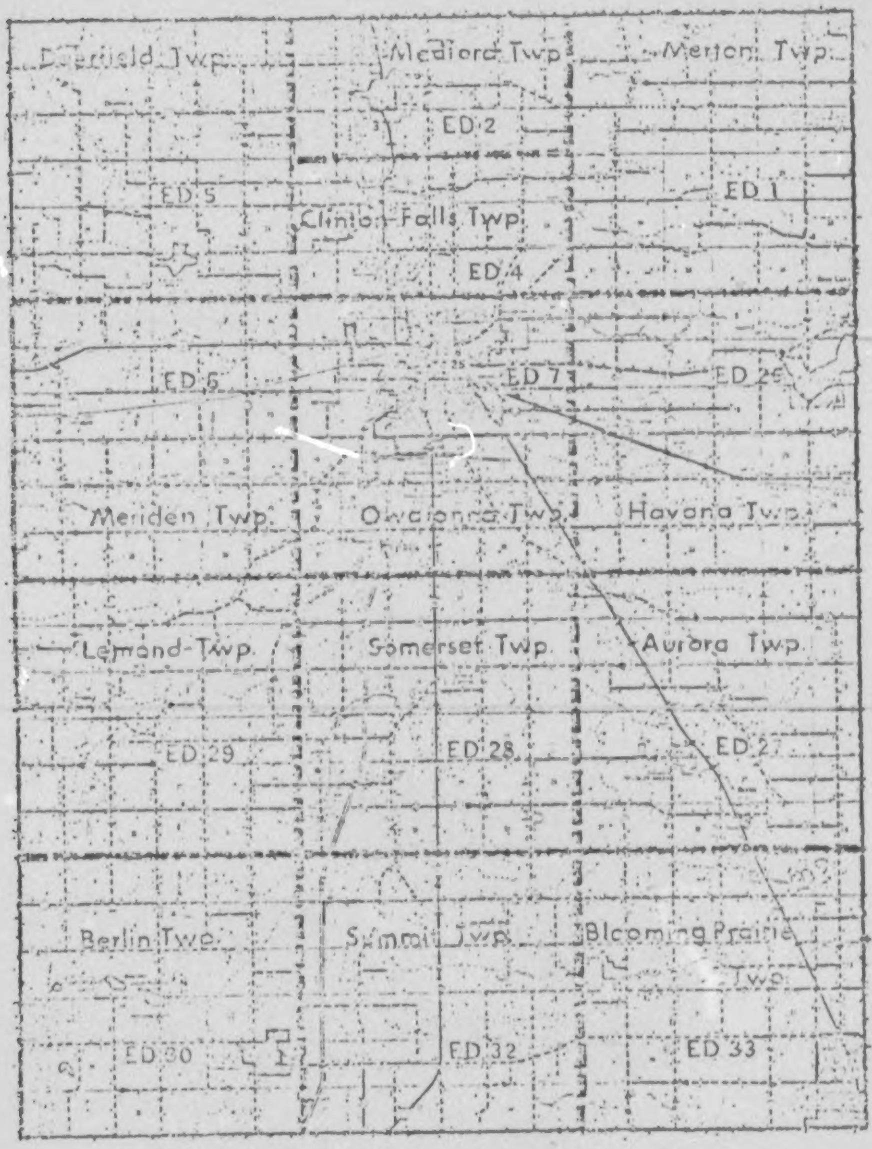
In metropolitan areas, a Census Tract (CT) instead of Enumeration District (ED) is used as the basic geographic segment. Again, all CT's in the geographic area to be studied must be identified and then listed in descending order by population size. Exhibit 13 shows a listing of the Census Tracts in South St. Paul. There are three census tracts and a total population of 25,016.

Regional Sampling

In drawing a sample for a region made up of several counties, listing can be accomplished in the same descending order for all ED's and CT's in the region. However, it is important to keep note of the county and area names with their respective ED or CT identification codes. An example of a partial listing of enumeration districts for Minnesota's Economic Region 4 (a nine county area) is shown in Exhibit 14. In this table, ED's are also listed in descending order by population.

EXHIBIT 10

ENUMERATION DISTRICTS IN GEOGRAPHIC AREA TO BE STUDIED (STEELE COUNTY, MINNESOTA)



Source: Copa, G., Persons, E., and Thomas P. Individual Demand for Vocational Education: Structure and Determination. Minnesota Research Coordinating Unit for Vocational Education, University of Minnesota, Minneapolis, February, 1973.

EXHIBIT 11

POPULATION AND HOUSING COUNT FOR ENUMERATION DISTRICTS IN SELECTED GEOGRAPHIC AREA (STEELE COUNTY, MINNESOTA)

Area Name	Enumeration District	1970 Population Count	1970 Housing Count
(1)	(2)	(3)	(4)
MERTON TWP	0001	475	157
MEDFORD TWP	0002	423	123
MEDFORD	0003	690	225
CLINTON FALLS TWP	0004	483	137
DEERFIELD TWP	0005	624	174
MERIDEN TWP	0006	791	233
OWATONNA TWP	0007	1,054	328
OWATONNA	0008	0	0
OWATONNA	0009	924	331
OWATONNA	0010	1,328	365
OWATONNA	0011	1,528	484
OWATONNA	0012	865	279
OWATONNA	0013	119	43
OWATONNA	0014	889	343
OWATONNA	0014.B	0	0
OWATONNA	0015	468	286
OWATONNA	0016	653	257
OWATONNA	0017	949	334
OWATONNA	0018	1,108	306
OWATONNA	0019	1,287	379
OWATONNA	0019.B	11	1
OWATONNA	0020	1,381	391
OWATONNA	0021	977	338
OWATONNA	0022	1,178	436
OWATONNA	0023	686	209
OWATONNA	0024	654	242
OWATONNA	0025	336	45
HAVANA TWP	0026	611	191
AURORA TWP	0027	726	232
SOMERSET TWP	0028	991	259
LEMOND TWP	0029	567	180
BERLIN TWP	0030	484	234
ELLENDALE	0031	569	211
SUMMIT TWP	0032	653	181
BLOOMING PRAIRIE TWP	0033	645	182
BLOOMING PRAIRIE	0034	1,001	335
BLOOMING PRAIRIE	0035	803	307

Source: See Exhibit 10

EXHIBIT 12

ENUMERATION DISTRICTS ARRANGED IN DESCENDING ORDER BY POPULATION COUNT (STEELE COUNTY, MINNESOTA)

Enumeration District	1970 Population Count	Area Name
(1)	(2)	(3)
0011	1,528	OWATONNA
0020	1,381	OWATONNA
0010	1,328	OWATONNA
0019	1,287	OWATONNA
0022	1,178	OWATONNA
0018	1,108	OWATONNA
0007	1,054	OWATONNA TWP
0034	1,001	BLOOMING PRAIRIE
0028	991	SOMERSET TWP
0021	977	OWATONNA TWP
0017	949	OWATONNA
0009	924	OWATONNA
0014	889	OWATONNA
0012	865	OWATONNA
0035	803	BLOOMING PRAIRIE
0006	791	MERIDEN TWP
0027	726	AURORA TWP
0003	690	MEDFORD
0023	686	OWATONNA
0024	654	OWATONNA
0016	653	OWATONNA
0032	653	SUMMIT TWP
0033	645	BLOOMING PRAIRIE TWP
0005	624	DEERFIELD TWP
0026	611	HAVANA TWP
0031	569	ELLENDALE
0029	567	LEMOND TWP
0030	484	BERLIN TWP
0004	483	CLINTON FALLS TWP
0001	475	MERTON TWP
0015	468	OWATONNA
0002	423	MEDFORD TWP
0025	336	OWATONNA
0013	119	OWATONNA
0019.B	11	OWATONNA
0008	0	OWATONNA
0014.B	0	OWATONNA

Source: See Exhibit 10

EXHIBIT 13

CENSUS TRACTS ARRANGED IN DESCENDING ORDER BY POPULATION COUNT
(SOUTH ST. PAUL, MINNESOTA)

Area Name	Census Tract	1970 Population Count
(1)	(2)	(3)
South St. Paul	0603	9,643
South St. Paul	0604	8,561
South St. Paul	0602	6,812

Source: Thomas, Paul, Method to determine the vocational education needs of adults in South St. Paul, Minnesota. EdD disseration, University of Minnesota: Minneapolis, 1974.

IDENTIFY HOUSEHOLDS IN GEOGRAPHIC SUB-DIVISIONS

The household is the basic unit of the sample in the procedure being described. Identifying the number of households in each ED or CT gives an indication of the relative size of the sample to be selected from the geographic sub-division.

Rural Area

In the fifth column of Exhibit 15, the information on number of households in each ED is referred to as "1970 HOUSING COUNT".

Metropolitan Area

In the fourth column of Exhibit 16, the number of households in each CT for South St. Paul appears under the heading "1970 HOUSING COUNT".

EXHIBIT 14

ENUMERATION DISTRICTS ARRANGED IN DESCENDING ORDER BY POPULATION COUNT
(ECONOMIC DEVELOPMENT REGION 4, MINNESOTA)

County Name (1)	ED Number (2)	Area Name (3)	Total Population (4)
Clay	0037	MOORHEAD	2,791
Clay	0024	MOORHEAD	1,738
Clay	0040	MOORHEAD	1,732
Otter Tail	0071	FERGUS FALLS	1,708
Douglas	0025	ALEXANDRIA TWP	1,692
Clay	0025	MOORHEAD	1,625
Clay	0043	MOORHEAD	1,549
Otter Tail	0070	FERGUS FALLS	1,543
Clay	0068	BARNESVILLE	1,509
Otter Tail	0080	FERGUS FALLS	1,439
Clay	0047	DILWORTH	1,417
Clay	0016	HAWLEY	1,371
Stevens	0014	MORRIS	1,215
Wilkin	0027	BRECKENRIDGE	1,212
Otter Tail	0024	PERHAM	1,208
Otter Tail	0072	FERGUS FALLS	1,184
Stevens	0010	MORRIS	1,149
Becker	0031	DETROIT LAKES	1,146
Pope	0013	STARBUCK	1,138
Becker	0034	DETROIT LAKES	1,122
Stevens	0012	MORRIS	1,112
Otter Tail	0069	FERGUS FALLS	1,086
Douglas	0036	ALEXANDRIA	1,069
Clay	0034	MOORHEAD	1,044
Pope	0017	GLENWOOD	1,037
Pope	0018	GLENWOOD	1,034
Becker	0053	FRAZEE	1,015
Otter Tail	0015	PELICAN RAPIDS	1,010
Clay	0029	MOORHEAD	1,004
Otter Tail	0075	FERGUS FALLS	956
Stevens	0013	MORRIS	955
Otter Tail	0073	FERGUS FALLS	923
Becker	0033	DETROIT LAKES	913
Traverse	0021	BROWNS VALLEY	906
Traverse	0009	WHEATON	894
Otter Tail	0096	PARKERS PRAIRIE	882
Otter Tail	0059	HENNING	850
Douglas	0037	LA GRAND TWP	794
Pope	0020	GLENWOOD TWP	732
Becker	0032	DETROIT LAKES	723
Becker	0054	LAKE VIEW TWP	690

EXHIBIT 14 (continued)

County Name	ED Number	Area Name	Total Population
Otter Tail	0085	DANE PRAIRIE TWP	562
Becker	0023	DETROIT TWP	524
Douglas	0014	IDA TWP	490
Otter Tail	0019	DORA TWP	370
Otter Tail	0012	SCRAMBLER TWP	323
Becker	0061	LAKE EUNICE TWP	289
Becker	0057	LAKE VIEW TWP	287
Otter Tail	0049	AMOR TWP	259
Otter Tail	0062	EVERTS TWP	242
Otter Tail	0018	LIDA TWP	205
Becker	0063	CORMORANT TWP	193
Otter Tail	0009	DUNN TWP	100

Source: Minnesota Analysis and Planning System, University of Minnesota, St. Paul.

ESTIMATE NUMBER OF SAMPLING SEGMENTS IN GEOGRAPHIC SUB-DIVISIONS

A sampling segment (SS) is a group of approximately six households. The clustering of households into groups of approximately six households each will be important later since it reduces the time necessary to select households and obtain names and addresses. The number of sampling segments in each geographic sub-division, ED or CT, is determined by dividing the total number of households in the ED or CT by six.

Rural Area

Exhibit 17 illustrates the results of the procedure for Steele County, a rural area (see fifth column). For example, ED 11 had a 1970 housing count of 484 (fourth column). When the 484 households were divided by six, it was estimated that ED 11 had 81 sampling segments. This can be contrasted to ED 31, which ranked 26th in order and had a housing count of 211 and 35 SS's.

EXHIBIT 15

POPULATION AND HOUSING COUNT FOR RURAL AREA (ECONOMIC DEVELOPMENT REGION 4, MINNESOTA)

County Name	ED Number	Area Name	Total Population	1970 Housing Count
(1)	(2)	(3)	(4)	(5)
Douglas	0025	ALEXANDRIA TWP	1,692	724
Otter Tail	0070	FERGUS FALLS	1,543	648
Otter Tail	0009	DUNN TWP	100	545
Clay	0040	MOORHEAD	1,732	519
Clay	0068	BARNESVILLE	1,509	516
Clay	0016	HAWLEY	1,371	489
Clay	0034	MOORHEAD	1,044	471
Pope	0013	STARBUCK	1,138	466
Clay	0043	MOORHEAD	1,549	465
Becker	0057	LAKE VIEW TWP	287	464
Stevens	0010	MORRIS	1,149	445
Clay	0024	MOORHEAD	1,738	442
Clay	0029	MOORHEAD	1,004	433
Clay	0025	MOORHEAD	1,625	421
Stevens	0014	MORRIS	1,215	412
Clay	0047	DILWORTH	1,417	406
Pope	0020	GLENWOOD TWP	732	406
Becker	0034	DETROIT LAKES	1,122	405
Otter Tail	0024	PERHAM	1,208	403
Pope	0017	GLENWOOD	1,037	403
Otter Tail	0018	LIDA TWP	205	402
Otter Tail	0071	FERGUS FALLS	1,708	401
Clay	0037	MOORHEAD	2,791	400
Otter Tail	0072	FERGUS FALLS	1,184	393
Stevens	0012	MORRIS	1,112	392
Otter Tail	0080	FERGUS FALLS	1,439	385
Becker	0054	LAKE VIEW TWP	690	382
Becker	0032	DETROIT LAKES	723	381
Becker	0053	FRAZEE	1,015	376
Becker	0061	LAKE EUNICE TWP	289	376
Traverse	0009	WHEATON	894	369
Becker	0023	DETROIT TWP	524	365
Douglas	0036	ALEXANDRIA	1,069	361
Becker	0031	DETROIT LAKES	1,146	359
Otter Tail	0015	PELICAN RAPIDS	1,010	358
Wilkin	0027	BRECKENRIDGE	1,212	355
Otter Tail	0059	HENNING	850	352
Pope	0018	GLENWOOD	1,034	351
Douglas	0014	IDA TWP	490	349
Otter Tail	0069	FERGUS FALLS	1,086	349

EXHIBIT 15 (continued)

County Name	ED Number	Area Name	Total Population	1970 Housing Count
(1)	(2)	(3)	(4)	(5)
Douglas	0037	LA GRAND TWP	794	345
Otter Tail	0096	PARKERS PRAIRIE	882	345
Otter Tail	0062	EVERTS TWP	242	343
Becker	0033	DETROIT LAKES	913	342
Traverse	0021	BROWNS VALLEY	906	342
Otter Tail	0073	FERGUS FALLS	923	340
Stevens	0013	MORRIS	955	338
Otter Tail	0049	AMOR TWP	259	333
Otter Tail	0012	SCAMBLER TWP	323	333
Otter Tail	0019	DORA TWP	370	331
Otter Tail	0075	FERGUS FALLS	956	325
Becker	0063	CORMORANT TWP	193	323
Otter Tail	0085	DANE PRAIRIE TWP	562	323

Source: See Exhibit 14

EXHIBIT 16

POPULATION AND HOUSING COUNT OR METROPOLITAN AREA
(SOUTH ST. PAUL, MINNESOTA)

Area Name	CT	1970 Population Count	1970 Housing Count
(1)	(2)	(3)	(4)
South St. Paul	0603	9,643	3,178
South St. Paul	0604	8,561	2,442
South St. Paul	0602	6,812	2,059

Source: See Exhibit 13

Metropolitan Area

The results of applying the procedure for a metropolitan area are illustrated in the fifth column of Exhibit 18. For example, CT 0603 had a 1970 housing count of 3,178 (fourth

EXHIBIT 17

ESTIMATING NUMBER OF SAMPLING SEGMENTS IN EACH ENUMERATION DISTRICT (STEELE COUNTY, MINNESOTA)

Area Name	Enumeration District	1970 Population Count	1970 Housing Count	SS's
(1)	(2)	(3)	(4)	(5)
OWATONNA	0011	1,538	484	81
OWATONNA	0020	1,381	391	65
OWATONNA	0010	1,328	365	61
OWATONNA	0019	1,287	379	63
OWATONNA	0022	1,178	436	73
OWATONNA	0018	1,108	306	51
OWATONNA TWP	0007	1,054	328	55
BLOOMING PRAIRIE	0034	1,001	335	57
SOMERSET TWP	0028	991	259	43
OWATONNA	0021	977	338	56
OWATONNA	0017	949	334	56
OWATONNA	0009	924	331	55
OWATONNA	0014	889	343	57
OWATONNA	0012	865	279	47
BLOOMING PRAIRIE	0035	803	307	51
MERIDEN TWP	0006	791	223	39
AURORA TWP	0027	726	232	39
MEDFORD	0003	690	225	38
OWATONNA	0023	686	209	35
OWATONNA	0024	654	242	40
OWATONNA	0016	653	257	43
SUMMIT TWP	0032	653	181	30
BLOOMING PRAIRIE TWP	0033	645	182	30
DEERFIELD TWP	0005	624	174	29
HAVANA TWP	0026	611	191	32
ELLENDALE	0031	569	211	35
LEMOND TWP	0029	567	180	30
BERLIN TWP	0030	484	154	26
CLINTON FALLS TWP	0004	483	137	23
MERTON TWP	0001	475	157	26
OWATONNA	0015	468	286	48
MEDFORD TWP	0002	423	123	21
OWATONNA	0025	336	45	8
OWATONNA	0013	119	43	7
OWATONNA	0019.B	11	1	12
OWATONNA	0008	0	0	-
OWATONNA	0014.B	0	0	-

Source: See Exhibit 10

EXHIBIT 18

ESTIMATING NUMBER OF SAMPLING SEGMENTS IN EACH CENSUS TRACT
(SOUTH ST. PAUL, MINNESOTA)

Area Name	CT	1970 Population Count	1970 Housing Count	SS's
(1)	(2)	(3)	(4)	(5)
South St. Paul	0603	9,643	3,178	530
South St. Paul	0604	8,561	2,442	407
South St. Paul	0602	6,812	2,059	343

Source: See Exhibit 13

column). When 3,178 was divided by six, it was determined that CT 0603 contained approximately 530 SS's. Census Tract 0604, on the other hand, contained 407 SS's while CT 0602 had 343. This procedure established the proportional representation for the three CT's in South St. Paul for the sample.

Note that for each geographic sub-division, the estimated number of sampling segments is rounded to the nearest whole number. For example, in Exhibit 17, ED 011 had a housing count 484. The number of sampling segments determined for ED 11 was 484/6 = 80.67 = 81.

DETERMINE CUMULATIVE NUMBER OF SAMPLING SEGMENTS IN GEOGRAPHIC AREA

The fourth step in the procedure is accomplished by adding the number of SS's in each ED or CT consecutively for all ED's or CT's within the area. The result is an estimate of the total number of sampling segments in the geographic area to be studied.

Rural Area

Exhibit 19 shows the result of applying the procedure in a rural area (see sixth column). Starting with ED 0011 which

EXHIBIT 19

ESTIMATING CUMMULATIVE NUMBER OF SAMPLING SEGMENT FOR RURAL AREA (STEELE COUNTY, MINNESOTA)

Area Name	Enumeration District	1970 Population Count	1970 Housing Count	SS's	Cummulative SS
(1)	(2)	(3)	(4)	(5)	(6)
OWATONNA	0011	1,528	484	81	0001-0081
OWATONNA	0020	1,381	391	65	0082-0146
OWATONNA	0010	1,328	365	61	0147-0207
OWATONNA	0019	1,287	379	63	0208-0270
OWATONNA	0022	1,178	436	73	0271-0343
OWATONNA	0018	1,108	306	51	0344-0394
OWATONNA TWP	0007	1,054	328	55	0395-0449
BLOOMING PRAIRIE	0034	1,001	335	57	0450-0506
SOMERSET TWP	0028	991	259	43	0507-0549
OWATONNA	0021	977	338	56	0550-0605
OWATONNA	0017	949	334	56	0606-0661
OWATONNA	0009	924	331	55	0662-0716
OWATONNA	0014	889	343	57	0717-0773
OWATONNA	0012	865	279	47	0774-0820
BLOOMING PRAIRIE	0035	803	307	51	0821-0871
MERIDEN TWP	0006	791	233	39	0872-0910
AURORA TWP	0027	726	232	39	0911-0949
MEDFORD	0003	690	225	38	0950-0987
OWATONNA	0023	686	209	35	0988-1022
OWATONNA	0024	654	242	40	1033-1062
OWATONNA	0016	653	257	43	1063-1105
SUMMIT TWP	0032	653	181	30	1106-1135
BLOOMING PRAIRIE TWP	0033	645	182	30	1136-1165
DEERFIELD TWP	0005	624	174	29	1166-1194
HAVANA TWP	0026	611	191	32	1195-1226
ELLENDALE	0031	569	211	35	1227-1261
LEMOND TWP	0029	567	180	30	1262-1291
BERLIN TWP	0030	484	154	26	1292-1318
CLINTON FALLS TWP	0004	483	137	23	1319-1341
MERTON TWP	0001	475	157	26	1342-1367
OWATONNA	0015	468	286	48	1368-1415
MEDFORD TWP	0002	423	123	21	1416-1436
OWATONNA	0025	336	45	8	1437-1444
OWATONNA	0013	119	43	7	1445-1451
OWATONNA	0019.B	11	1	12	
OWATONNA	0008	0	0	-	-
OWATONNA	0014.B	0	0	-	-

Source: See Exhibit 10

had an estimated 81 sampling segment, the cummulative number of sampling segments range from 0001 to 0081. Moving to the next ED in order, ED 0020, with 65 sampling segments the cummulative range of sampling segments now goes from 0082 (which is 0081 + 1) to 0146 (or 0081 + 65) and so on for the balance of the ED's. For each ED, it is important to list the range of cummulative SS's appropriate for the number of SS estimated for the ED. The total number of SS's in Steele County was 1,451 as indicated by the last entry in the column. The identical procedure is followed to obtain the cummulative number of SS's for a region.

Metropolitan Area

The results of the procedure are illustrated for a metropolitan area in the sixth column of Exhibit 20. The final result shows an estimated total of 1,280 SS's from which, ultimately, some sample will be selected.

EXHIBIT 20

ESTIMATING CUMMULATIVE NUMBER OF SAMPLING SEGMENTS
FOR METROPOLITAN AREA (SOUTH ST. PAUL, MINNEOSTA)

Area Name	CT	1970 Population Count	1970 Housing Count	SS's	Cummulative SS's
(1)	(2)	(3)	(4)	(5)	(6)
South St. Paul	0603	9,643	3,178	503	0000-0530
South St. Paul	0604	8,561	2,442	407	0531-0937
South St. Paul	0602	6,812	2,059	343	0937-1280

Source: See Exhibit 13

DETERMINE NUMBER OF SAMPLING SEGMENTS SELECTED FROM GEOGRAPHIC SUB-DIVISIONS

Having established an estimate of the number of sampling segments, the rank of cummulative sampling segments for each geographic sub-division, and the cummulative number of sampling segments in the whole geographic area, the number of sampling segments to be drawn from each geographic sub-division can now be determined. The procedure used is designed to sample all ED's and CT's systematically and in such a manner that the sample selected will represent an accurate cross-section of the total population. This requires that ED's and CT's with high population and housing counts have a larger number of SS's chosen for the survey than less densely populated ED's and CT's. Sampling in the above manner assures that the probability of selection will be proportionate to the population of each ED or CT.

Rural Area

In the Steele County example, the desired sample size of the survey was twenty percent of all households in the county or one out of every five households. Therefore, to start the sampling of SS's, a number between "one" and "five" is randomly selected. This digit becomes the base number, and "5's" are added in succession until this series of number exceed the cummulative number of SS's in the whole geographic area (1,451).

In Exhibit 21, the results of the process are illustrated in the seventh column. In actual sampling, the digit "2" was randomly selected. The digit "5" was added to each succeeding number (i.e., 2, 7, 12, . . . 1,247, 1,452) until the cummulative measures of size (1,451 SS's) was exceeded. The number of SS's to be drawn from each ED is equal to the number of random numbers falling in the range of cummulative SS's within the given ED. For example, the ED 30 (Berlin township) has 26 SS's and these 26 occurred as numbers 1292-1318 in the cummulative SS's column. The random numbers falling within this range were 1292, 1297, 1302, 1307, 1312, and 1317. Therefore, six (the number of random numbers within the range) sample segments are to be sampled for the survey from ED 30.

The procedure provides a count of the exact number of SS's to be drawn from each ED with ED's being sampled proportionate to their population size. The number of SS's to be drawn from each ED is shown in the eighth column of Exhibit 21.

EXHIBIT 21

ESTIMATING THE NUMBER OF SAMPLING SEGMENTS FOR SELECTION (STEELE COUNTY, MINNESOTA)

Area Name	Enumeration District	1970 Population Count	1970 Housing Count	SS's	Cummulative SS	Random Number (0-5)	Number Random Nos.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
OWATONNA	0011	1,528	484	81	0001-0081	2, 7, 12, 17, 22, 27, 32, 27, 42, 47, 52, 57, 62, 67, 72, 77	16
OWATONNA	0020	1,381	391	65	0082-0146	82, 87, 92, 97, 102, 107, 112, 117, 122, 127, 132, 137, 142	13
OWATONNA	0010	1,328	365	61	0147-0207	147, 152, 157, 162, 167, 172, 177, 182, 187, 192, 197, 202, 207	13
OWATONNA	0019	1,287	379	63	0208-0270	212, 217, 222, 227, 232, 237, 242, 247, 252, 257, 262, 267	12
OWATONNA	0022	1,178	436	73	0271-0343	272, 277, 282, 287, 292, 297, 302, 307, 312, 317, 322, 327, 332, 337, 342	15
OWATONNA	0018	1,108	306	51	0344-0394	347, 352, 357, 362, 367, 372, 377, 382, 387, 392	10
OWATONNA TWP	0007	1,054	328	55	0395-0449	397, 402, 407, 412, 417, 422, 427, 432, 437, 442, 447	11
BLOOMING PRAIRIE	0034	1,001	335	57	0450-0506	452, 457, 462, 467, 472, 477, 482, 487, 492, 497, 502	11
SOMERSET TWP	0028	991	259	43	0507-0549	507, 512, 517, 522, 527, 532, 537, 542, 547	9
OWATONNA	0021	977	338	56	0550-0605	552, 557, 562, 567, 572, 577, 582, 587, 592, 597, 602	11
OWATONNA	0017	949	334	56	0606-0661	607, 612, 617, 622, 627, 632, 637, 642, 647, 652, 657	11
OWATONNA	0009	924	331	55	0662-0716	662, 667, 672, 677, 682, 687, 692, 697, 702, 707, 712	11
OWATONNA	0014	889	343	57	0717-0773	717, 722, 727, 732, 737, 742, 747, 752, 757, 762, 767, 772	12
OWATONNA	0012	865	279	47	0074-0820	777, 782, 787, 792, 797, 802, 807, 812, 817	9
BLOOMING PRAIRIE	0035	803	307	51	0821-0871	822, 827, 832, 837, 842, 847, 852, 857, 862, 867	10

EXHIBIT 21 (continued)

Area Name	Enumeration District	1970 Population Count	1970 Housing Count	SS's	Cummulative SS	Random Number (0-5)	Number Random Nos.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MERIDEN TWP	0006	791	233	39	0872-0910	872, 877, 882, 887, 892, 987, 902, 907	8
AURORA TWP	0027	726	232	39	0911-0949	912, 917, 922, 927, 932, 937, 942, 947	8
MEDFORD	0003	690	225	38	0950-0987	952, 957, 962, 967, 972, 977, 982, 987	8
OWATONNA	0023	686	209	35	0988-1022	992, 997, 1002, 1007, 1012, 1017, 1022	7
OWATONNA	0024	654	242	40	1033-1062	1027, 1032, 1037, 1042, 1047, 1052, 1057, 1062	8
OWATONNA	0016	653	257	43	1063-1105	1067, 1072, 1077, 1082, 1087, 1092, 1097, 1102	8
SUMMIT TWP	0032	653	181	30	1106-1135	1107, 1112, 1117, 1122, 1127, 1132	6
BLOOMING PRAIRIE TWP	0033	645	182	30	1136-1165	1137, 1142, 1147, 1152, 1157, 1162	6
DEERFIELD TWP	0005	624	174	29	1166-1194	1167, 1172, 1177, 1182, 1187, 1192	6
HAVANA TWP	0026	611	191	32	1195-1266	1197, 1202, 1207, 1212, 1217, 1222	6
ELLENDALE	0031	569	211	35	1227-1261	1227, 1232, 1237, 1232, 1247, 1252, 1257	7
LEMOND TWP	0029	567	180	30	1262-1291	1262, 1267, 1272, 1277, 1282, 1287	6
BERLIN TWP	0030	484	154	26	1292-1318	1292, 1297, 1302, 1307, 1312, 1317	6
CLINTON FALLS TWP	0004	483	137	23	1319-1341	1322, 1327, 1332, 1337	4
MERTON TWP	0001	475	157	26	1342-1367	1342, 1347, 1352, 1357, 1362, 1367	6
OWATONNA	0015	468	286	48	1368-1415	1372, 1377, 1382, 1387, 1392, 1397, 1402, 1407, 1412	9
MEDFORD TWP	0002	423	123	21	1416-1436	1417, 1422, 1427, 1432	4
OWATONNA	0025	336	45	8	1437-1444	1437, 1442	2
OWATONNA	0013	119	43	7	1445-1451	1447, 1452	1
OWATONNA	0019.B	11	1	12			
OWATONNA	0008	0	0	-	-		
OWATONNA	0014.B	0	0	-	-		

Source: See Exhibit 13

Metropolitan Area

The identical procedure is used to determine the number of sampling segments to be drawn from each CT in a metropolitan area. Exhibit 22 illustrates the results of the procedure in the seventh and eighth columns. Assuming a ten percent sample was desired and the random number selected was 5, the seventh column starts at 5 and increases by 10 until the cummulative number of SS's for the geographic area is exceeded.

Note that the proportion of the total population desired in the sample can be calculated from a predetermined sampling percentage or a predetermined number of households. In Steele County, the predetermined sample was 20% of the population. Hence, the desired proportion was 20/100 or 1/5 of the population. The result was the selection of one of every five households. If the total number of households in the county or region is 70,000 and a sample of 3,500 households is desired, the percentage can be calculated as 3,500/70,000 X 100 or 5%. The desired proportion is then 5/100 or one twentieth of the population. The result will be the selection of one in every twenty households.

EXHIBIT 22

ESTIMATING THE NUMBER OF SAMPLING SEGMENTS FOR SELECTION
(SOUTH ST. PAUL, MINNESOTA)

Area Name	CT	1970 Population Count	1970 Housing Count	SS's	Cummulative SS's	Randon No. (0-10) = 5	Random No. Selection
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
South St. Paul	0603	9,643	3,178	530	0000-0530	5, 15, 25... 520, 525	53
South St. Paul	0604	8,561	2,442	407	0531-0937	535-935	41
South St. Paul	0602	6,812	2,059	343	0938-1280	945-1,275	34

Source: See Exhibit 13

LOCATE HOUSEHOLDS WITHIN GEOGRAPHIC SUB-DIVISIONS

Each sampling segment is to be composed of approximately six household units. The household unit may be an apartment, a mobile home, or any other place of residence. All the dwelling units in each ED or CT must be geographically located so that the ED or CT can be accurately divided into the number of sampling segments estimated for each ED or CT in the third step of the procedure.

Rural Area

There are many methods of locating households, any or all of which may be necessary to locate all the households in a geographic area. These methods are listed below:

1. Use of County Map. The highway department prepares maps with the enumeration districts superimposed and with households in rural communities located on the maps. The location of the households may not be complete since the maps depend entirely upon census data and are not updated between censes. These maps are available at MAPS (for Minnesota) or by writing to the Department of Commerce.

2. Use of Utility Company Maps. These maps identify the location of the households to which utilities are provided. All households will not subscribe to all utilities; thus, household location by this method alone may not be complete.

3. County Platt Books. Platt books locate households and list addresses.[10]

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[10] Sources of Platt book and rural directories:

R.L. Polk and Company
800 Nalpak Building
333 Selby Street
St. Paul, MN 55109

Title Atlas Company, Inc.
Box 638
Minneapolis, MN 55446

Midland Atlas Company
Milbank, SD 57252

Directory Service Company
Algona, Iowa 55011

4. Use of Aerial Photographs. Photographs showing location of households are available from the Soil Conservation Service. These photos may be especially useful for locating households in small towns and villages.

5. Use of the County Assessor Files. These files list the names and addresses of home owners only.

6. Drive Around the Area in Which the Households Must be Located. This is a time consuming procedure and should be used as a last resort.

Exhibit 23 shows the location of households within an Enumeration District in Steele County. In population centers for which "place" maps are provided, households are located only in areas that do not form city blocks. By using an approximation to the Census procedure, city blocks can be used as sampling segments for the area of the city which has blocks laid out; and, therefore, it is not necessary to locate households in these areas. Exhibit 24 shows a "place" map of Hawley (a population center in Clay County, Minnesota, which is designated as an ED). Note that it was not necessary to identify households for the group of city blocks located in the center of Hawley. However, households -- plotted as darkened circles -- must be located for the "non-blocked" areas surrounding the group of city blocks as shown in Exhibit 25.

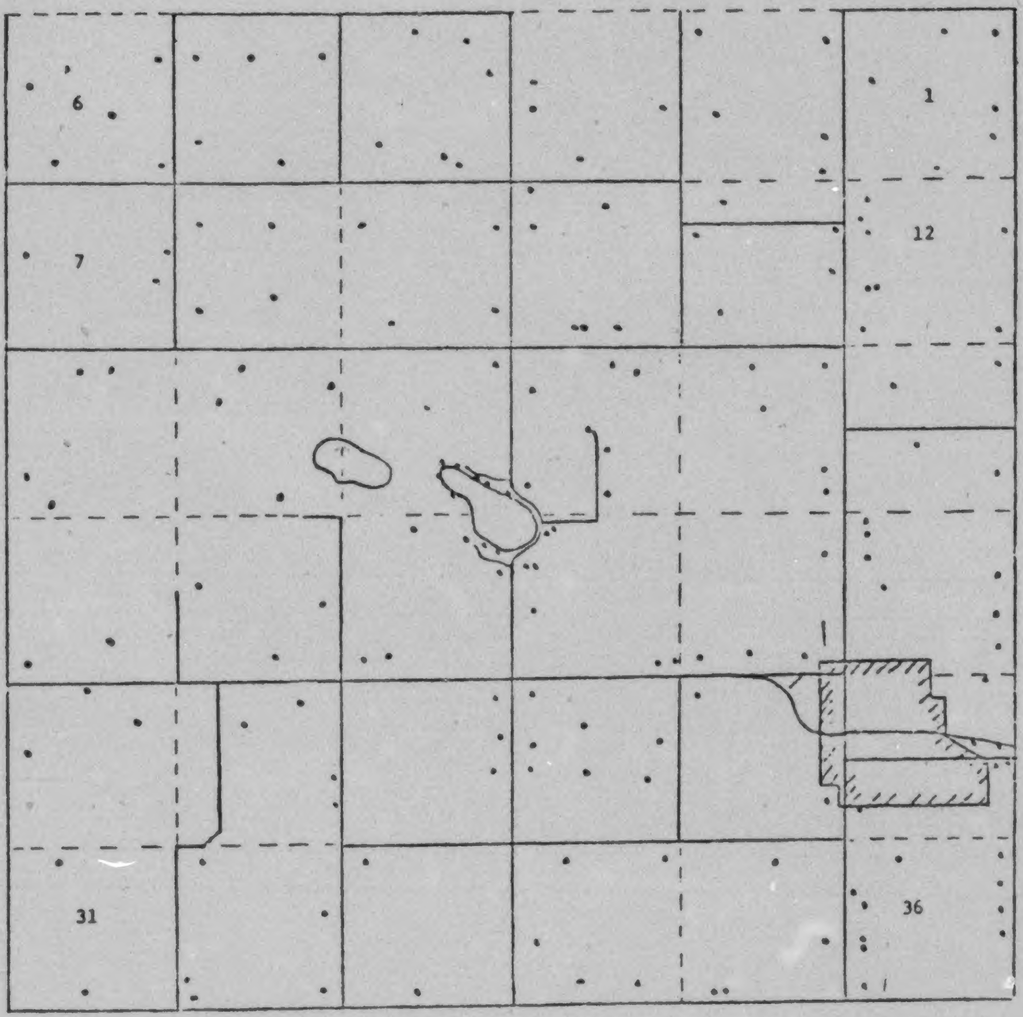
Metropolitan Area

City blocks are used as sampling segments in metropolitan areas; therefore, the location and plotting of households are not necessary. At this stage of the sampling procedure, however, it is helpful to list all the blocks within each census tract of the metropolitan area. Exhibit 26 shows a list of block numbers in Census Tract 602 in South St. Paul.

Note that Census Tracts are sub-divided when the population of the CT exceeds 4,000 residents. The CT numbers 60201 and 60202 appearing in Exhibit 26 refers to the first and second sub-divisions of CT 602.

EXHIBIT 23

LOCATION OF HOUSEHOLDS IN AN ENUMERATION DISTRICT
(ED IN STEELE COUNTY, MINNESOTA)

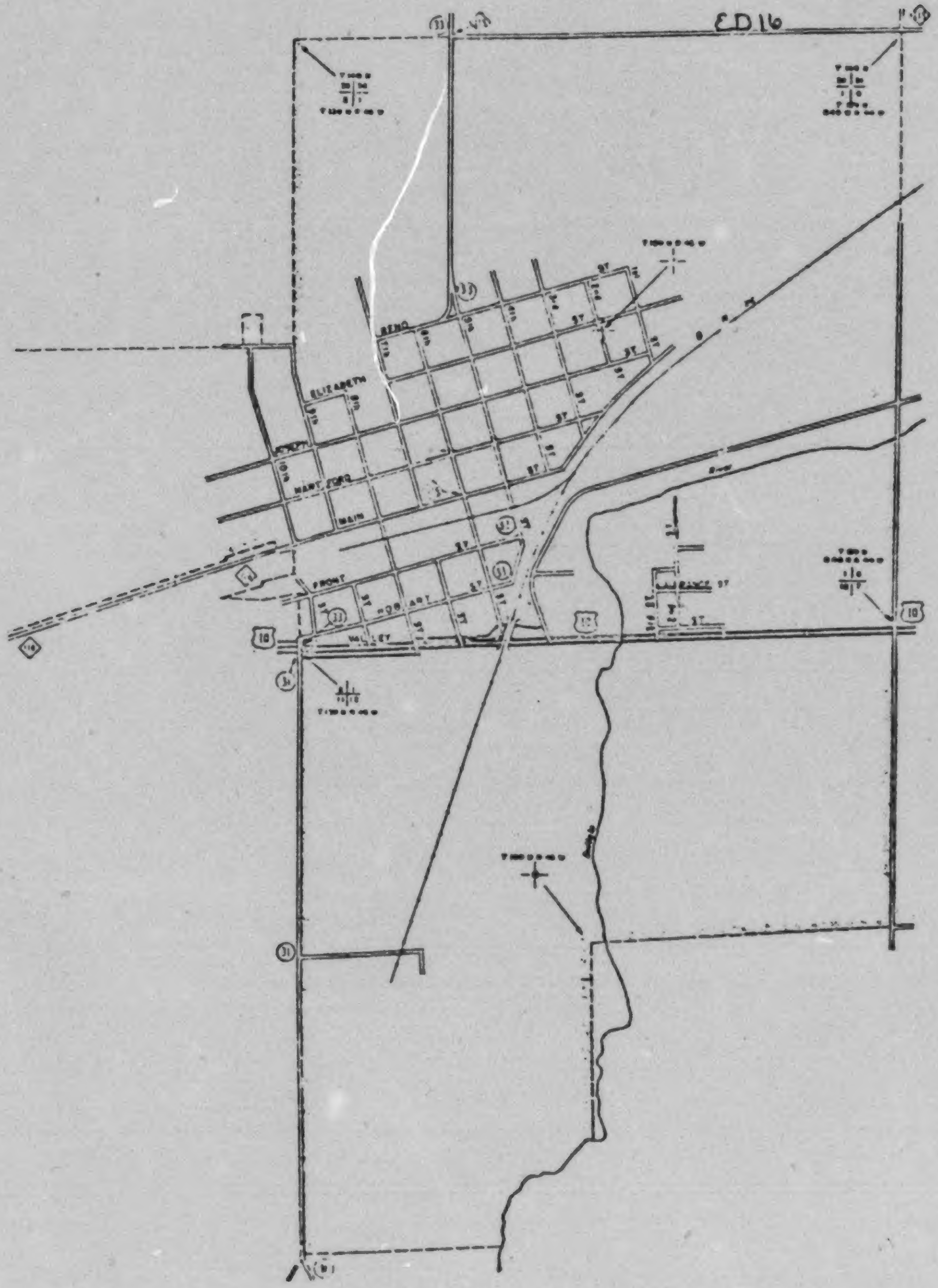


Source: See Exhibit 10

60

EXHIBIT 24

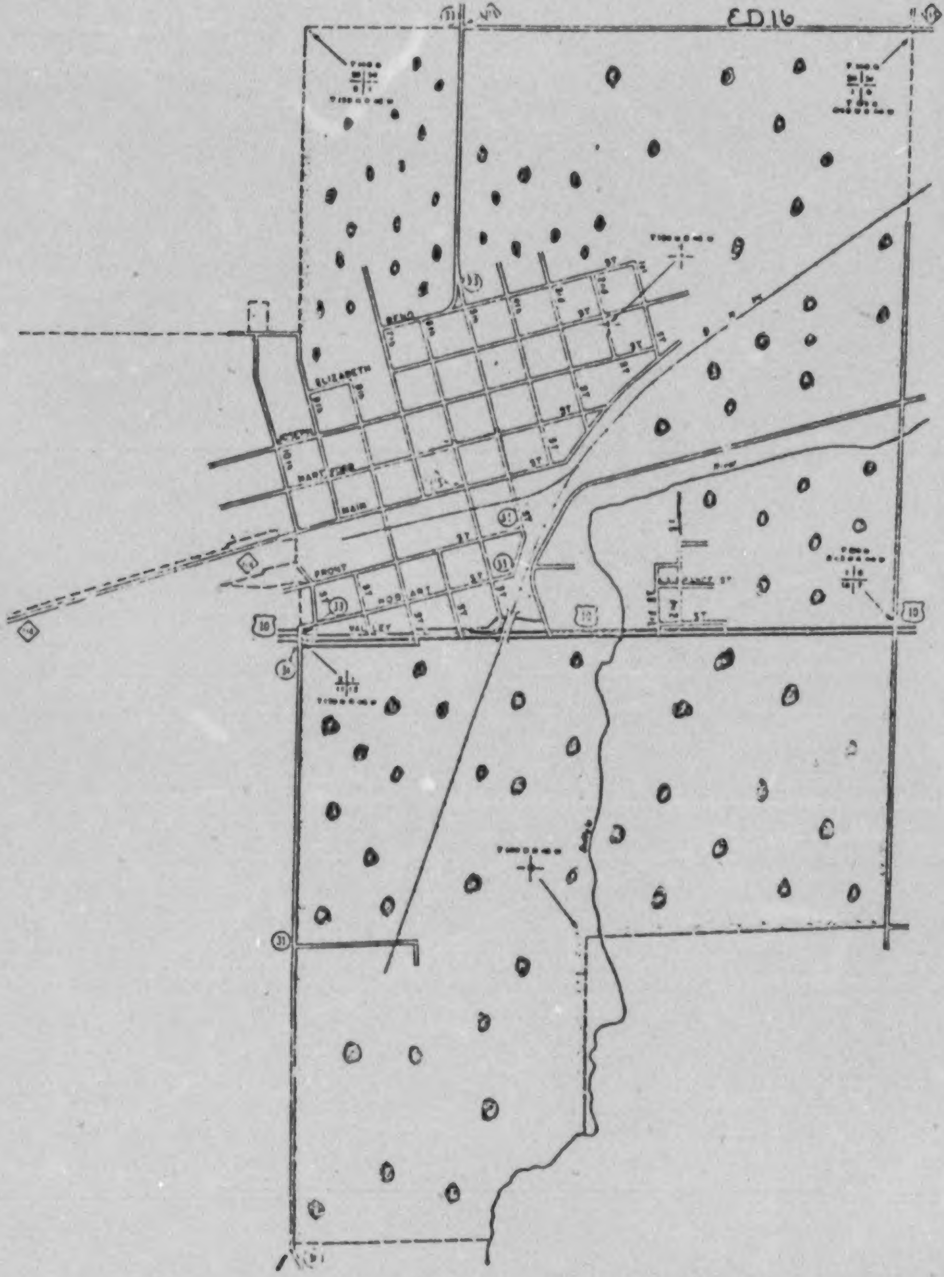
PLACE MAP FOR A POPULATION CENTER IN A RURAL AREA
(HAWLEY, MINNESOTA)



Source: United States Department of Commerce, Bureau of Census.

EXHIBIT 25

LOCATION OF HOUSEHOLDS IN NON-BLOCKED AREA OF POPULATION CENTER IN RURAL AREA (HAWLEY, MINNESOTA)



Source: Minnesota Research Coordinating Unit for Vocational Education,
Department of Vocational Technical Education, University of
Minnesota, Minneapolis, Minnesota.

EXHIBIT 26

LIST OF BLOCK NUMBERS FOR A CENSUS TRACT (SOUTH ST. PAUL, MINNESOTA)

County Code	CEN TRCT or BNA	Block Number
(1)	(2)	(3)
307	060201	101
037	060201	105
037	060201	107
037	060201	108
037	060201	111
037	060201	112
037	060201	113
037	060201	118
037	060201	119
037	060201	121
037	060201	212
037	060601	213
037	060601	214
037	060201	215
037	060201	216
037	060201	217
037	060201	218
037	060201	219
037	060201	222
037	060201	224
037	060201	301
037	060201	302
037	060201	303
037	060201	305
037	060201	306
037	060201	313
037	060201	314
037	060201	315
037	060201	316
037	060201	317
037	060201	318
037	060201	319
037	060201	320
037	060201	321
037	060201	322
037	060201	323
037	060201	324
037	060202	101
037	060202	104
037	060202	105
037	060202	120
037	060202	122
037	060202	123
037	060202	124
037	060202	201
037	060202	202
037	060202	203
037	060202	204
037	060202	205
037	060202	206
037	060202	207
037	060202	208
037	060202	209
037	060202	210
037	060202	211
037	060202	213
037	060202	214
037	060202	216
037	060202	217
037	060202	218
037	060202	219
037	060202	220
037	060202	221
037	060202	222
037	060202	223
037	060202	224
037	060202	225
037	060202	226
037	060202	227
037	060202	301
037	060202	302
037	060202	303
027	060202	304
037	060202	305
037	060202	306
037	060202	307
037	060202	309
037	060202	312
037	060202	313
037	060202	314

EXHIBIT 26 (continued)

County Code (1)	CEN TRCT or BNA (2)	Block Number (3)	County Code (1)	CEN TRCT or BNA (2)	Block Number (3)
037	060202	106	037	060202	318
037	060202	112	037	060202	901
037	060202	113	037	060202	905
037	060202	117			

Source: See Exhibit 13

GROUP HOUSEHOLDS INTO SAMPLING SEGMENTS

Rural Area

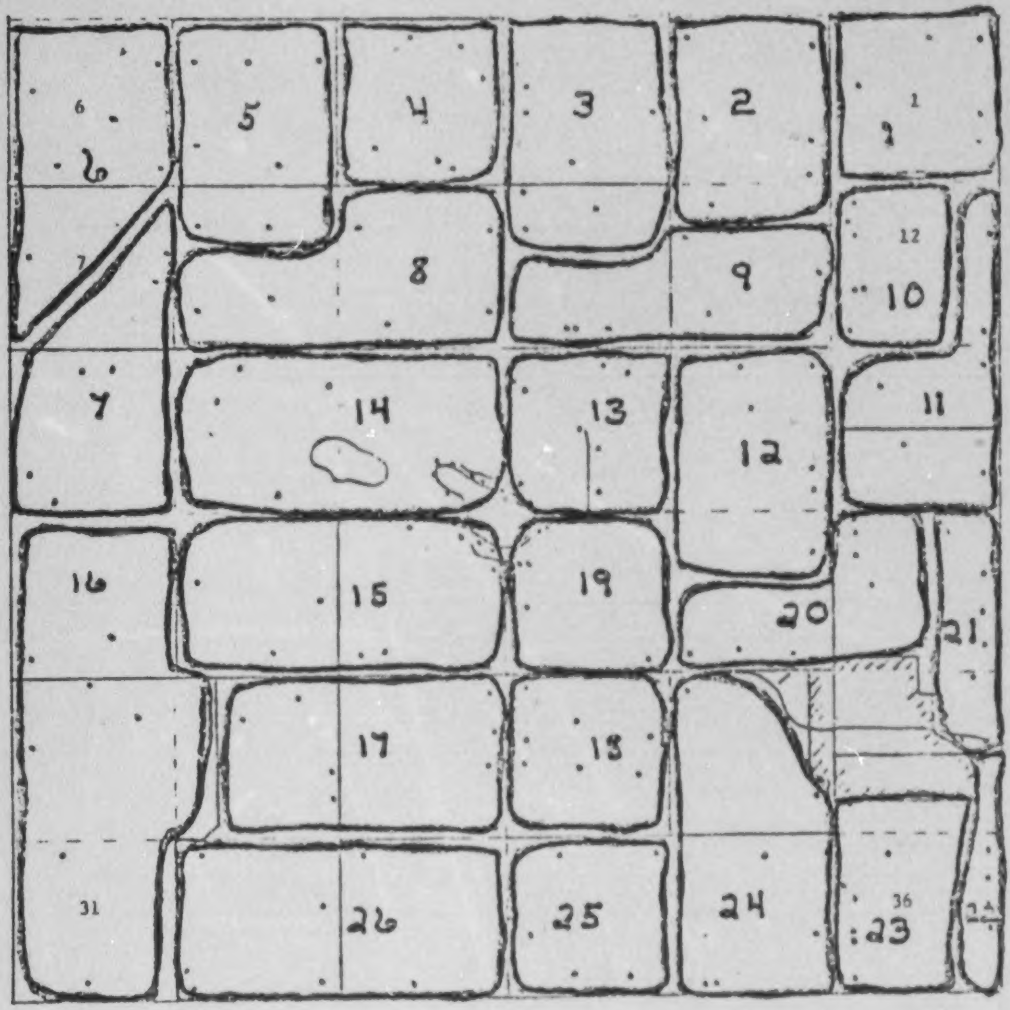
Grouping households into sampling segments aids the process of random selection. After the households have been located (previous step), they are grouped together with approximately 6 households per group. In making the groupings, natural boundaries such as streets, roads, rivers, etc. should be used as much as possible since it facilitates easier identification of households in a particular sample segment.

Each sample segment is then assigned a number. The SS's are numbered consecutively beginning with "one", and proceeding in surpentine fashion until each group within the ED has been assigned a number. Exhibit 27 illustrates how the sample ED (see Exhibit 23) was divided into SS's of approximately 6 households and then numbered. In this example, there are 26 SS's in the ED.

In population centers for which "place" maps are provided, the located households (see Exhibit 25) are grouped into sampling segments of 6 households and each of the city blocks is considered a sampling segment disregarding the number of households within the block. Sampling segments are then numbered consecutively until each SS within the ED is assigned a number. The map of Hawley as shown in Exhibit 28 illustrates the results of the procedure for numbering sampling segments when "place" maps are provided. In this example there are 63 sampling segments in the ED.

EXHIBIT 27

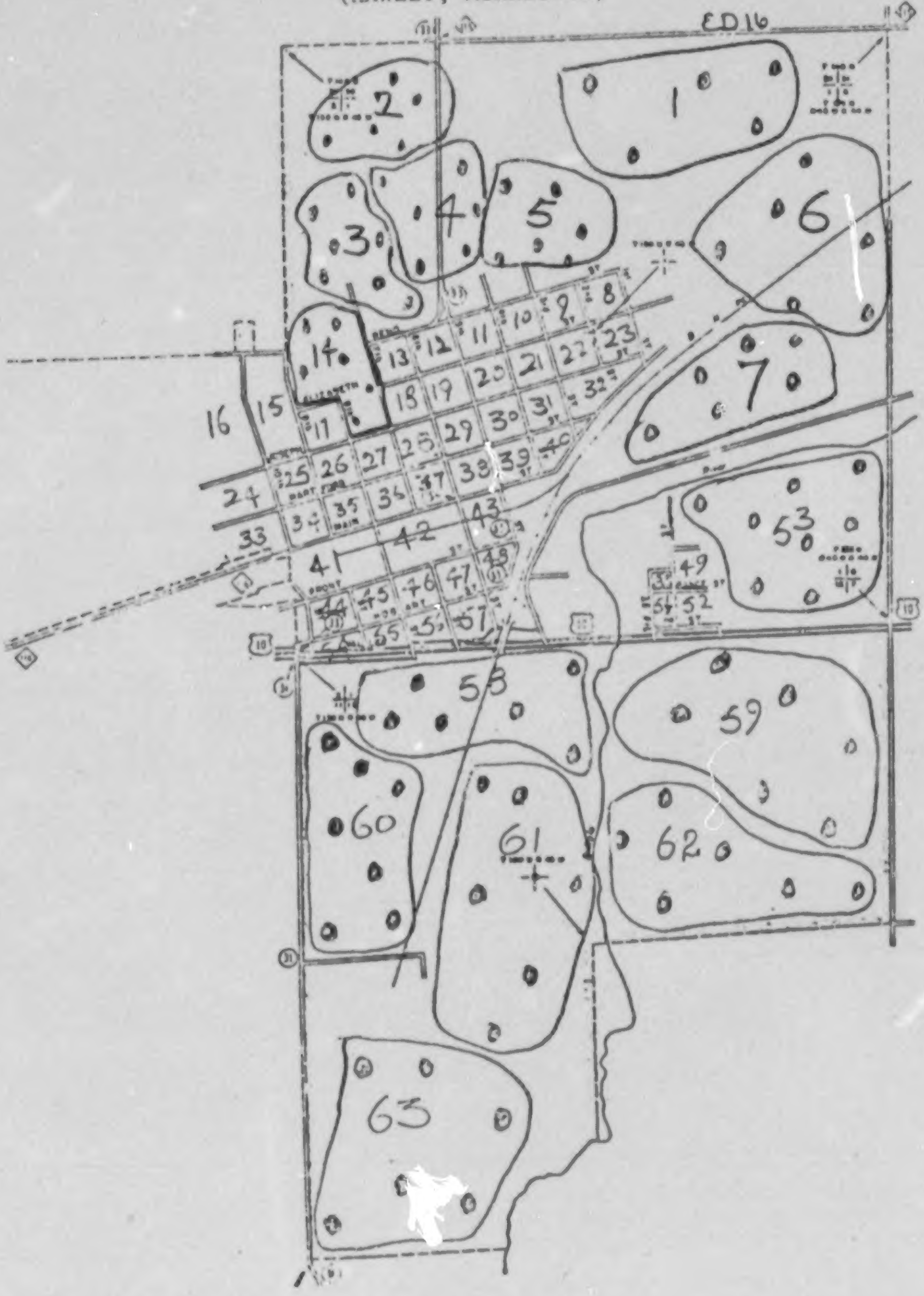
GROUPING HOUSEHOLDS INTO SAMPLING SEGMENTS IN RURAL AREA AND NUMBERING SAMPLING SEGMENTS (ED IN STEELE COUNTY, MINNESOTA)



Source: See Exhibit 10

EXHIBIT 28

GROUPING HOUSEHOLDS IN NON-BLOCKED AREA OF POPULATION CENTER IN RURAL AREA INTO SAMPLING SEGMENTS AND NUMBERING SAMPLE SEGMENTS (HAWLEY, MINNESOTA)



Source: See Exhibit 25

Metropoiitan Area

In a metropolitan area with a list of blocks for each census tract, a number is assigned, beginning at 'one' in each CT and proceeding until each block within that CT is assigned a sampling segment number. In Exhibit 29, the blocks of CT 602 were assigned numbers (see fourth column).

SELECT SAMPLING SEGMENTS FOR SAMPLE

The sample segments of an Enumeration District or Census Tract are to be randomly selected. This is accomplished by using a random number table such as commonly available in statistical references (see Appendix III). The exact number of SS's to be chosen from each ED or CT is determined by the results of the fifth step of the sampling procedure described earlier. Random numbers occurring between "one" and the number of SS's in the ED or CT are selected without replacement until as many numbers are chosen as there are sampling segments to be selected for that ED or CT.

Rural Area

As an example, Exhibit 21 shows that nine sampling segments (eighth column) must be selected from the 43 SS's of Somerset township. Hence, the first nine random numbers occurring between the numbers "one" and "fourty-three" will identify the nine sampling segments to be selected from this ED.

Metropolitan Area

As an example, Exhibit 22 shows that 34 SS's (eighth column) must be selected from the 343 SS's of CT 602. In Exhibit 29, the blocks are numbered one through 87 for CT 602. Hence, the first 34 random numbers occurring between the numbers "one" and "eighty-seven" will identify the 34 blocks from each of

EXHIBIT 29

ASSIGNING SAMPLING SEGMENT NUMBERS TO BLOCKS WITHIN CENSUS TRACT (SOUTH ST. PAUL, MINNESOTA)

County Code	CEN TRCT or BNA	Block Code	Sampling Segment Number
(1)	(2)	(3)	(4)
037	060201	101	1
037	060201	105	2
037	060201	107	3
037	060201	108	4
037	060201	111	5
037	060201	112	6
037	060201	113	7
037	060201	118	8
037	060201	119	9
037	060201	121	10
037	060201	212	11
037	060201	213	12
037	060201	214	13
037	060201	215	14
037	060201	216	15
037	060201	217	16
037	060201	218	17
037	060201	219	18
037	060201	222	19
037	060201	224	20
037	060201	301	21
037	060201	302	22
037	060201	303	23
037	060201	305	24
037	060201	306	25
037	060201	313	26
037	060201	314	27
037	060201	315	28
037	060201	316	29
037	060201	317	30
037	060201	318	31
037	060201	319	32
037	060201	320	33
037	060201	321	34
037	060201	322	35
037	060201	323	36
037	060201	324	37
037	060202	101	38
037	060202	104	39

EXHIBIT 29 (continued)

County Code	CEN TRCT or BNA	Block Code	Sampling Segment Number
(1)	(2)	(3)	(4)
037	060202	105	40
037	060202	106	41
037	060202	112	42
037	060202	113	43
037	060202	117	44
037	060202	120	45
037	060202	122	46
037	060202	123	47
037	060202	124	48
037	060202	201	49
037	060202	202	50
037	060202	203	51
037	060202	204	52
037	060202	205	53
037	060202	206	54
037	060202	207	55
037	060202	208	56
037	060202	209	57
037	060202	210	58
037	060202	211	59
037	060202	213	60
037	060202	214	61
037	060202	216	62
037	060202	217	63
037	060202	218	64
037	060202	219	65
037	060202	220	66
037	060202	221	67
037	060202	222	68
037	060202	223	69
037	060202	224	70
037	060202	225	71
037	060202	226	72
037	060202	227	73
037	060202	301	74
037	060202	302	75
037	060202	303	76
037	060202	304	77
037	060202	305	78
037	060202	306	79
037	060202	307	80

EXHIBIT 29 (continued)

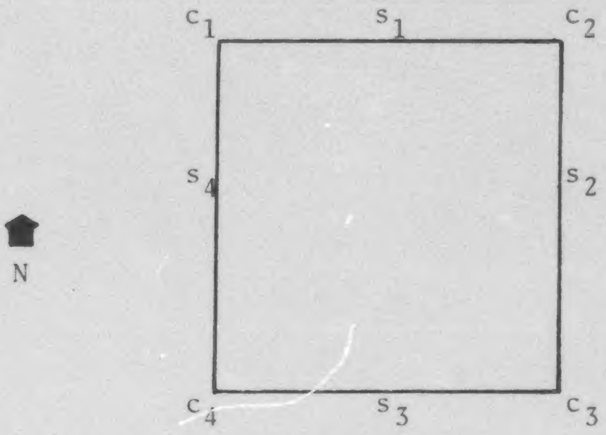
County Code	CEN TRCT or BNA	Block Code	Sampling Segment Number
(1)	(2)	(3)	(4)
037	060202	309	81
037	060202	312	82
037	060202	313	83
037	060202	314	84
037	060202	318	85
037	060202	901	86
037	060202	305	87

Source: See Exhibit 25

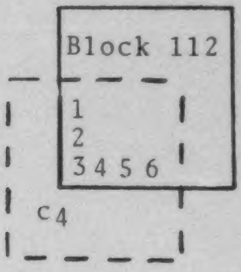
which approximately 6 households will be chosen.

Since 6 households are to be randomly selected from each block, it is necessary to establish a procedure to approach randomness. One means of accomplishing the selection is to rotate selection positions in the following manner:

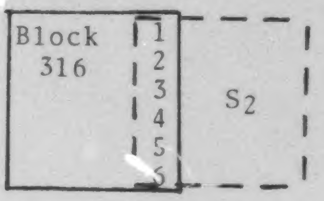
1. In the illustration below, a block is sketched with the direction north denoted by an arrow, and symbols are used to represent positions within the block. The letter "c" refers to corner, and "s" refers to side. The subscripts attached to each letter represents a specific position within the block.



2. Alongside the block identification number for each block to be included in the sample, a symbol should be placed to note the position in that block from which 6 households will be chosen. When selecting from corners, three households should be selected from each side of the corner. The 6 households nearest the center should be chosen when selecting from sides. Starting in a arbitrary position (i.e. c_1) rotate around the block in a clockwise fashion (i.e., the following blocks would be assigned the positions s_1, c_2, s_2, c_3, etc.). Following are two examples. In the first example, 6 households should be selected from the 4th corner of Block 112. This information would be listed as 112(c_4).



In the second example, 6 houses are chosen from side 2 of block 316. This information would be listed as 316(s_2). If an apartment complex is chosen in one of the blocks, select 6 housing units from one floor in the complex.



IDENTIFY NAMES AND ADDRESSES FOR HOUSEHOLDS TO BE SAMPLED

The identification and listing of names and addresses of households marks the end of the sample selection procedure. Telephone numbers, if available, should also be recorded at this time.

Rural Areas

Names and addresses are obtained by the methods listed in the step entitled, "Locate Households Within Geographic Sub-Division". Persons familiar with the area and its residents, usually community residents, can be of immense help in identifying names and addresses.

Metropolitan Areas

A census map with block descriptions (Metro Series Map) should be obtained for the metropolitan area of concern, and the selected blocks for inclusion in the sample identified. The location of households, with the appropriate names and addresses, is the next step. A "city directory", if available and current, is best used to identify names and addresses for metropolitan communities. The "city directory" is essentially a reverse telephone directory providing the names, addresses, and telephone numbers of persons living in each block of the community.

SUMMARY

The procedure outlined in this chapter results in the identification of the names and addresses of persons living in a random sample of households in the geographic area to be studied. The process, however, is not entirely free of hindrances. In some cases, the blocks chosen or loactions identified are within an industrial sector of the community which is devoid of housing units; in other cases, the households identified are summer homes, resort locations, or public institutions. Sometimes households are identified in areas where floods, renewal, or highway construction caused evacuation. In all cases, other sampling segments must be identified to replace segments that are not usable.

It should also be noted here that a computer program to aid in selecting the sample has been developed by the Minnesota Analysis and Planning System (MAPS). This program identifies the number of sampling segments to be selected from each ED, and is available for public use. An example of the program output is exhibited in Appendix IV.

CHAPTER IV

DATA COLLECTION

Having selected a sample of households with the names and addresses of persons living in them, the next phase of the assessment procedure is to contact and elicit responses from members of the households. In this chapter, the procedure for contacting households and coding questionnaire responses will be explained. The chapter is divided into the following five sections: (1) preparation of the household identification form, (2) preparation and mailing of questionnaires, (3) handling returned questionnaires, (4) contacting non-respondents, and (5) coding.

PREPARE HOUSEHOLD IDENTIFICATION FORMS

The purpose of the Household Identification Form is to facilitate effective management of the assessment procedure through the coding and listing of households, and the recording of information pertinent to contacting the households. Each household can be identified by its location in a particular county, the number of the sampling segment in which it is located, and its position within a list of households to be sampled from each county. The Identification Form is provided to record information relating to the households of one sampling segment. Exhibit 30 shows a sample Identification Form. Subsequent paragraphs explain the procedure for coding household identification data using the following three criteria for identification: (1) county code, (2) sampling segment code, and (3) county household position code.

County and Sampling Segment Code

The identification code for a household within a county depends on whether the household is located in a rural or an urban area. If the household is in a rural area, the first line of the form shows three factors for identification: (1) a three digit county code, (2) a four digit ED code, and (3) a two digit code for identifying the sampling segment. A list of county code numbers for Minnesota is presented in Exhibit 31. For example, Becker county is coded 005.

Rural 005 0063 06
(County) (E.D.) (S.S.)

The ED number for Cormorant township within Becker county would be coded 0063 (see Exhibit 14). Since sampling segments with approximately six households each were to be identified and numbered within this ED, the two digit code to be placed above "S.S." would be the number of the sampling segment in which the six households are located. In Exhibit 27 of the previous section, the sampling segment in the upper left hand corner would be coded 06.

In a metropolitan area, there are four factors to be coded for identification: (1) county code, (2) Census Tract code, (3) block code, and (4) sampling segment code. These four factors are shown in the second line of the Household Identification Form.

The county code is similar to the county code previously mentioned and can be obtained from Exhibit 31 for Minnesota. For a metropolitan area, a Census Tract code is used instead of an ED code. A Census Tract is a larger population unit than an ED and may incorporate several ED's. The code number for a Census Tract is basically four digits. However, tracts can be sub-divided according to population growth, and two additional digits may be added. Exhibit 29 shows the Census Tract data for South St. Paul (County Number 037). Census Tract 0602 has been divided into 2 subsections 0602.01 and 0602.02. Hence, a household unit that is situated in Census Tract 0602.02 would be coded as follows:

Urban 037 060202 ___ ___
(County) (Cen. Tract) (Block) (S.S.)

Each Census Tract is further sub-divided into groups of city blocks, and each block can be identified by a code. Although a code exists to identify block groups, it is not used since block groups are unnecessary for sample selection. However, blocks within these groups are identified. The first line of Exhibit 26 refers to block number 101. Since the SS Code number is 01, the second line of the Household Identification Form would be coded:

Urban 037 060201 101 01
(County) (Cen. Tract) (Block) (S.S.)

EXHIBIT 30

HOUSEHOLD IDENTIFICATION FORM

Rural ___ ___ (County) ___ ___ (E.D.)

Urban ___ ___ (County) ___ ___ (Cen.Tract) ___ ___ (Block) ___ ___ (S.S.) ___ ___ (Area Name)

Household Number	Name Address	Telephone Number	Mailing 1 2	Telephone 1 2 3	Complete
1	(___ ___ ___ ___) ___ ___ ___	___ Comments:	___ ___	___ ___ ___	___
2	(___ ___ ___ ___) ___ ___ ___	___ Comments:	___ ___	___ ___ ___	___
3	(___ ___ ___ ___) ___ ___ ___	___ Comments:	___ ___	___ ___ ___	___
4.	(___ ___ ___ ___) ___ ___ ___	___ Comments:	___ ___	___ ___ ___	___
5.	(___ ___ ___ ___) ___ ___ ___	___ Comments:	___ ___	___ ___ ___	___
6.	(___ ___ ___ ___) ___ ___ ___	___ Comments:	___ ___	___ ___ ___	___
7.	(___ ___ ___ ___) ___ ___ ___	___ Comments:	___ ___	___ ___ ___	___

EXHIBIT 31

COUNTY IDENTIFICATION CODES FOR MINNESOTA

State Name: Minnesota   State Abbreviation: MN   State Code: 27

Code	County Name	Code	County Name	Code	County Name
001	Aitkin	071	Koochiching	141	Sherburne
003	Anoka	073	Lac Qui Parle	143	Sibley
005	Becker	075	Lake	145	Stearns
007	Beltrami	077	Lake of the Woods	147	Steele
009	Benton	079	Le Sueur	149	Stevens
011	Big Stone	081	Lincoln	151	Swift
013	Blue Earth	083	Lyon	153	Todd
015	Brown	085	McLeod	155	Traverse
017	Carlton	087	Mahnomen	157	Wabasha
019	Carver	089	Marshall	159	Wadena
021	Cass	091	Martin	161	Waseca
023	Chippewa	093	Meeker	163	Washington
025	Chisago	095	Mille Lacs	165	Watonwan
027	Clay	097	Morrison	167	Wilkin
029	Clearwater	099	Mower	169	Winona
031	Cook	101	Murray	171	Wright
033	Cottonwood	103	Nicollet	173	Yellow Medicin
035	Crow Wing	105	Nobles		
037	Dakota	107	Norman		
039	Dodge	109	Olmsted		
041	Douglas	111	Otter Tail		
043	Faribault	113	Pennington		
045	Fillmore	115	Pine		
047	Freeborn	117	Pipestone		
049	Goodhue	119	Polk		
051	Grant	121	Pope		
053	Hennepin	123	Ramsey		
055	Houston	125	Red Lake		
057	Hubbard	127	Redwood		
059	Isanti	129	Renville		
061	Itasca	131	Rice		
063	Jackson	133	Rock		
065	Kanabeck	135	Roseau		
067	Kandiyohi	137	St. Louis		
069	Kittson	139	Scott		

Source: United States Department of Commerce, Bureau of Census.

County Household Position Code

The County Household Position Code serves as a quick numeric reference for each household to be contacted; it will be used extensively during the data collection process. To obtain the household position code, all counties in a region being studied should be listed in alphabetical order and numbered. The number corresponding to a county will be the first digit of the position code for a household in that county. Households selected from a county should be numbered sequentially. The number corresponding to a household should be placed in the next four spaces after the County Identification Number.

The following example is a list of the counties in Minnesota's Economic Development Region 4:

1. Becker
2. Clay
3. Douglas
4. Grant
5. Otter Tail
6. Pope
7. Stevens
8. Traverse
9. Wilkin

The first household coded for Douglas County will be coded as follows:

Household Number	Name Address
1 (3 0 0 0 1)	
	Mr. Arthur Williams
	House No. Street
	Minnesota Zip Code

The address of that household would be placed on the remaining three lines.

Household Related Information

Another purpose of the household identification form is to record information pertinent to contacting households. In the right hand columns corresponding to each household, the form provides for recording five items of information: Telephone number, mail status, telephone follow-up status, completeness status, and comments.

The section for recording the telephone number is the first section in the series of broken lines as illustrated below. The telephone number should be recorded at the same time as the name and address if the telephone number is available at that time.

Telephone Number	Mailing		Telephone			Complete
	1	2	1	2	3	
739-3287						

COMMENTS: call after 5 p.m.

Mailing status refers to the steps in mailing questionnaires to the households. When the first questionnaire is mailed to a household, a check is placed under the figure "1". If no return is received after two weeks and a second questionnaire is mailed, a check is placed under the figure "2".

A telephone follow-up is necessary when no return is received from a household after two mailings. A check is placed under the figures "1", "2", or "3" after the first, second, or third attempt is made to contact the household by telephone.

In the last section of the series of broken lines, a check is made when the questionnaire is returned for the corresponding household. A space is left under the broken line to record supplementary information.

Household Identification Forms should be placed in three-ring loose leaf binders in sequential order by County Household Position Code. For the example shown, the households of Becker County would be placed first followed by the households of Clay County, Douglas County, etc. It may be necessary to use separate binders for each county since returned questionnaires will be placed in the binder immediately behind the Household Identification Form. This would facilitate easy correspondence between the forms and the returned questionnaires.

PREPARE AND MAIL QUESTIONNAIRES

To successfully determine the educational needs of a community, it is important to secure a high return from the selected sample. This section of the procedure handbook gives guidelines for preparing, mailing, and encouraging the return of questionnaires; the section will be divided into a series of stages.

Stage 1: Securing Supplies

The following supplies are needed: (1) rubber stamp containing the name and address of the office responsible for mailing, (2) number 10 and number 8 envelopes, (3) stationery, (4) large commemorative stamps, (5) regular stamps, and (6) copies of the questionnaire.

Stage 2: Preparing Cover Letters

It is necessary to compose a cover letter which will accompany the questionnaire. This letter should be composed according to the following guidelines:

1. The letter should: (1) appear on official letterhead, (2) be signed by a person in authority whom respondents may know, and (3) be personally addressed in the same type used in the body of the letter.

2. The letter should contain the following sections:

    a. Introduction: The introduction should contain: (1) a personal greeting, (2) mention of the purpose of the study, and (3) a section stressing the importance of returning the questionnaire.

    b. Directions: This section is extremely important and should be included verbatim as shown in the sample cover letter presented in Exhibit 32.

    c. Closing: This paragraph should include:

(1) reminder to complete the form and return it soon, (2) an explanation of the confidentiality and how the information will be used, (3) re-emphasis of the importance of returning the questionnaire, and (4) a note of appreciation, a phone number, and the name of a contact person who can answer questions about the survey.

To assist in composing the cover letter, a sample is presented in Exhibit 32.

3. A cover letter should be prepared for each household to be contacted.

Stage 3: Preparing Questionnaires

Questionnaires must be printed and coded before being mailed to households. Specific directions are as follows:

1. Secure ten times as many questionnaires as there are households to be contacted (i.e., if 4,000 households are to be contacted, about 40,000 questionnaires are needed). This will allow each household to obtain five questionnaires, and enough extras for a second mailing and the replacement of damaged questionnaires.

2. Copy the County Household Position Code (from the Household Identification Form) in the boxes at the upper right hand corner of the questionnaire (see Appendix I). The code for the household must be put on each of the five questionnaires being mailed to a household. Remember that the code number is different for each household.

Stage 4: Preparing the Envelopes

Envelopes should be prepared in the following way so as to insure completeness and accuracy.

1. Personally address an envelope to each household to be contacted. The address should be typed in the same type style on the cover letter or use a general heading. Envelopes should be addressed to the name of the head of the household, or the "present resident". It is best to do cover letter and envelope at the same time to avoid mix-ups when stuffing the envelopes.

2. Stamp the envelopes with a colorful commenorative stamp (e.g., a wildlife stamp).

3. Envelopes should have official letterhead for return address.

4. Envelopes should be mailed "first class" since this will require the post office to return any envelopes which are not delivered.

5. Prepare return envelopes (No. 8 envelopes) with office address and stamp. A sample envelope for mailing and returning questionnaires is shown in Exhibit 33.

Stage 5: Mailing Questionnaires

Questionnaires must be mailed in an organized manner; the following steps provide guidelines.

1. Be certain that each envelope contains five questionnaires and a return envelope.

2. Be certain that questionnaires are mailed to all the households selected in the sample.

3. Mail all questionnaires on the same day, at least for specific geographic areas such as counties.

4. For each household, place a check on the Household Identification Form to indicate that the first questionnaire has been mailed.

PROCESS RETURNED QUESTIONNAIRES

As questionnaires are received, each one should be processed separately. This section of the handbook outlines the procedure for handling the returned questionnaires. Additional large loose leaf binders may be needed for filing questionnaires if the sample is large. The steps in processing return questionnaires are as follows:

1. Establish a convenient and reliable procedure to obtain the returned questionnaires from office mail.
2. Each returned questionnaire should be unfolded, stamped with the present date, and placed in the loose leaf binder for questionnaires returning from that county. The first digit in the code number at the upper left hand corner of the questionnaires will identify the county.
3. On the Household Identification Form corresponding to the questionnaire, place a check mark in the complete column if the questionnaire is complete. The number at the top left hand corner of the questionnaire is used for locating the household in the binder containing the household identification forms.

CONTACT NON-RESPONDENTS

The quality of the needs assessment is directly related to the number of questionnaires returned. For this reason, anyone who fails to return an original questionnaire is contacted again and urged to return it. This section describes the steps designed to help obtain the needed responses:

1. Two weeks after the original mailing of the questionnaire, mail a reminder letter and a second set of copies of the questionnaires to those households which have not returned a questionnaire.

A sample of the reminder letter appears as Exhibit 34. The name and address of each household can be found by consulting the appropriate Household Identification Form. Households listed without a check in the "complete" column are those households that are non-respondents at this point in time. Preparation for the second mailing should begin a week after the first mailing in order to be ready to send the second mailing two weeks after the first. It is extremely important to follow the mailing schedule as closely as possible. Send the reminder letter and another set of questionnaires to all who are non-respondents. Immediately before mailing the second batch of questionnaires, check the last mail delivery for returned questionnaires. Withdraw questionnaires from the second mailing for households that have recently returned questionnaires.

2. Four weeks after the original (first) mailing of the questionnaires, begin telephoning those households which have not returned a questionnaire. A sample script for the call appears as Exhibit 35. Follow the script as closely as possible for each call. For best possible results, calls should be made between 5:00 p.m. and 7:00 p.m. In rural areas with a high population of farmers, calls should be made at lunch time and in the late evening during the summer months.

CODE QUESTIONNAIRES

The purpose of coding is to facilitate computer data analysis through the transfer of information from the completed questionnaires onto computer cards. The data from each questionnaire is transferred to one computer card. The numbers along the right side of the questionnaire refer to card columns to which coded questionnaire responses will be transferred.

Directions for coding as presented here are specifically pertinent to persons involved in coding the questionnaire responses. Parts of the procedure, however, pertain specifically to the keypunching process, and to persons involved in transferring the coded data to computer cards. Keypunch specific directions are indicated in the sections that follow and can be skipped by persons coding responses.

The procedure for coding is explained by alphabetical sections as they appear on the sample questionnaire (see Appendix I). Examples are given of the proper coding procedure for each section. However, before referring to specific sections, an explanation is given of the procedure for completing the Identification Code in the boxes at the top left of the questionnaire.

Completing Identification Code

The primary purpose of the Identification Code is to enable data to be summarized for selected segments of the population. The first five digits of the code is the household identification number. The first digit identifies the county, while the remaining 4 digits identify the households within that county (see previous section on preparing County Household Position Code). In the following example (see Frame 1), 3 refers to Douglas county, and 0004 refers to the fourth household selected in Douglas County.

1	2				3	4
3	0	0	0	4	1	2

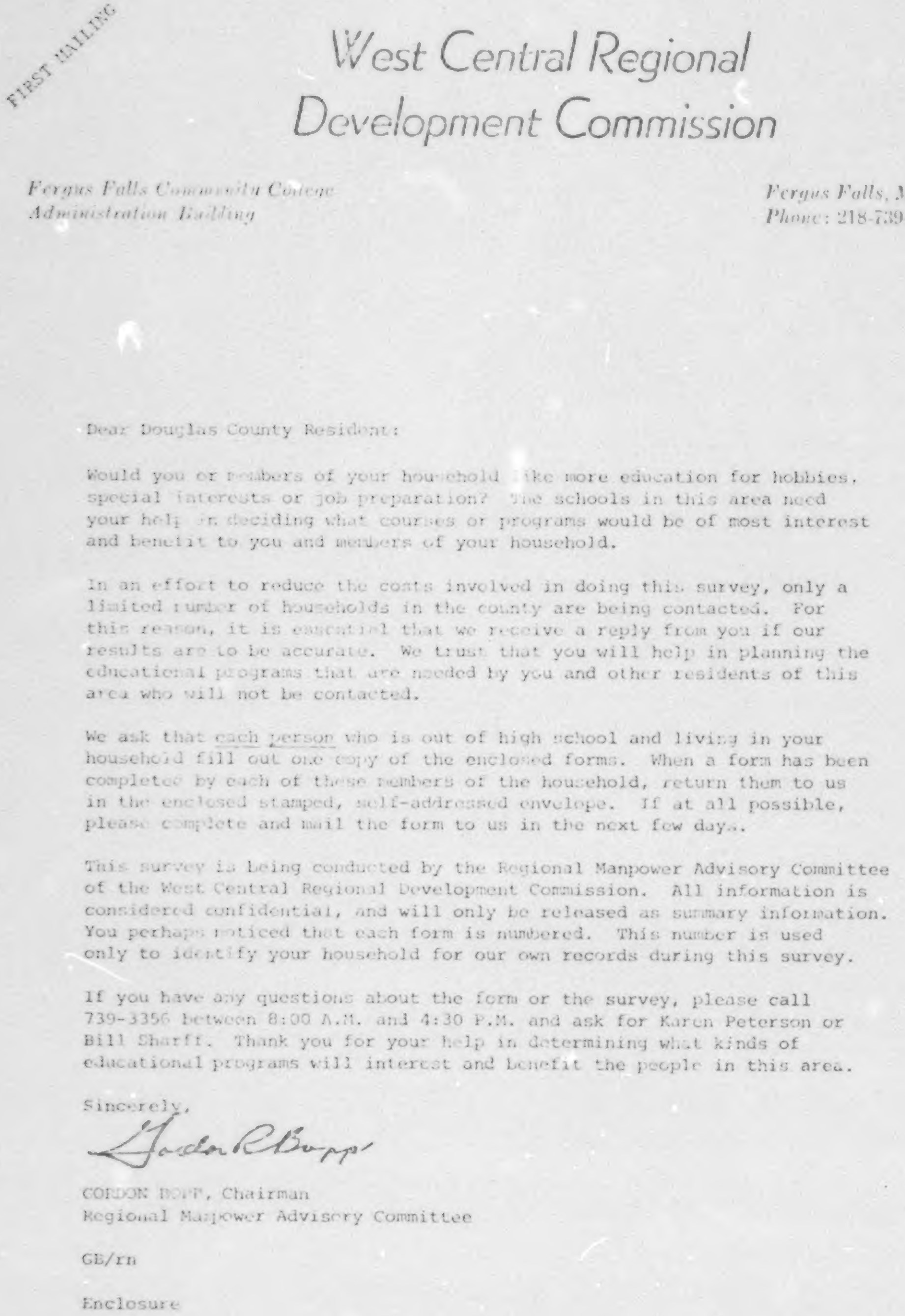
1 - County
2 - Household
3 - Person within household
4 - Community type

FRAME 1

The sixth digit identifies the individual within each household. If one questionnaire is returned from a household, the number '1' is placed in this space; but, if three questionnaires are returned, each questionnaire is numbered consecutively. In the above example, only one questionnaire was returned from the household. In the example shown in Frame 2, three questionnaires were returned from household 0015 in Douglas County. The questionnaire

EXHIBIT 32

SAMPLE COVER LETTER FOR FIRST MAILING IN STUDY



FIRST MAILING

West Central Regional
Development Commission

Fergus Falls Community College
Administration Building

Fergus Falls, Minnesota 56537
Phone: 218-739-3356

Dear Douglas County Resident:

Would you or members of your household like more education for hobbies, special interests or job preparation? The schools in this area need your help in deciding what courses or programs would be of most interest and benefit to you and members of your household.

In an effort to reduce the costs involved in doing this survey, only a limited number of households in the county are being contacted. For this reason, it is essential that we receive a reply from you if our results are to be accurate. We trust that you will help in planning the educational programs that are needed by you and other residents of this area who will not be contacted.

We ask that each person who is out of high school and living in your household fill out one copy of the enclosed forms. When a form has been completed by each of these members of the household, return them to us in the enclosed stamped, self-addressed envelope. If at all possible, please complete and mail the form to us in the next few days.

This survey is being conducted by the Regional Manpower Advisory Committee of the West Central Regional Development Commission. All information is considered confidential, and will only be released as summary information. You perhaps noticed that each form is numbered. This number is used only to identify your household for our own records during this survey.

If you have any questions about the form or the survey, please call 739-3356 between 8:00 A.M. and 4:30 P.M. and ask for Karen Peterson or Bill Sharff. Thank you for your help in determining what kinds of educational programs will interest and benefit the people in this area.

Sincerely,

Gordon R Bopp

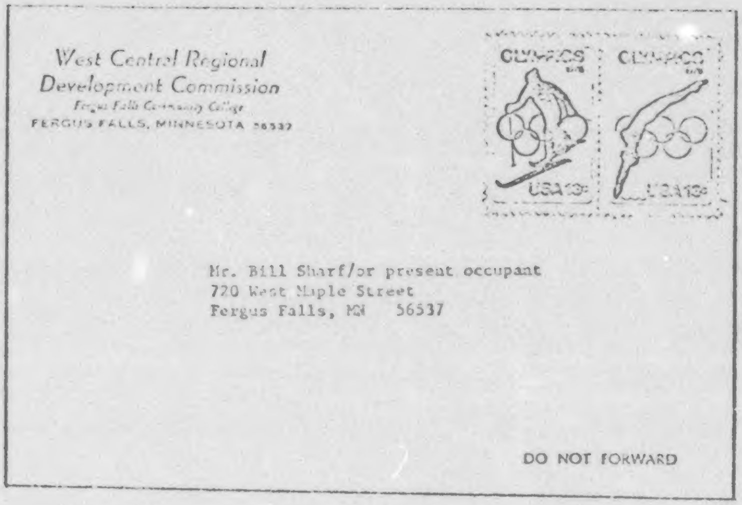
GORDON BOPP, Chairman
Regional Manpower Advisory Committee

GB/rn

Enclosure

EXHIBIT 33

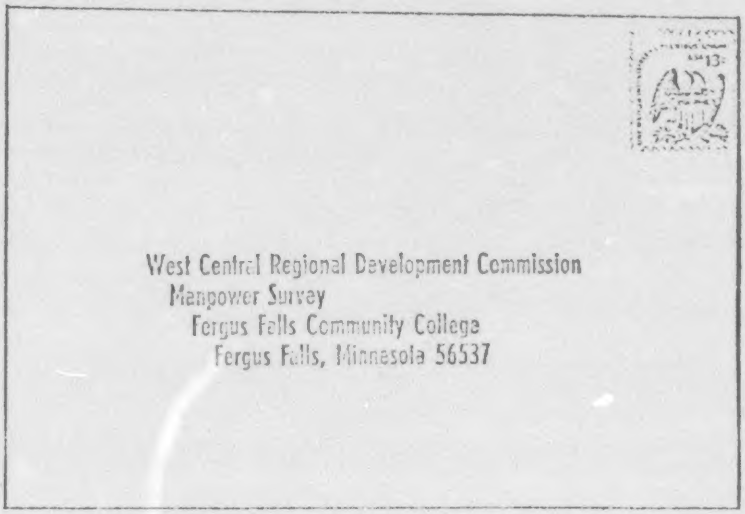
SENDING AND RETURN ENVELOPES


OLYMPICS
USA 13c
OLYMPICS
USA 13c

West Central Regional
Development Commission
Fergus Falls Community College
FERGUS FALLS, MINNESOTA 56537

Mr. Bill Sharf/or present occupant
720 West Maple Street
Fergus Falls, MN 56537

DO NOT FORWARD



West Central Regional Development Commission
Manpower Survey
Fergus Falls Community College
Fergus Falls, Minnesota 56537

EXHIBIT 34

SAMPLE COVER LETTER FOR SECOND MAILING IN STUDY

SECOND MAILING

West Central Regional
Development Commission

Fergus Falls Community College
Administration Building

Fergus Falls, Minnesota 56537
Phone: 218-739-3356

June 3, 1976

Dear Becker County Resident:

We do need your help! Within the past two weeks, you received a letter from us with a set of questionnaires for completion by each person living in your household who is over high school age. We have not received any completed questionnaire from your household. Answers to the questionnaires will be used to plan adult educational programs for hobbies, special interests, or job related training which better meet the needs of your household and other county residents.

For your convenience, we have enclosed another set of questionnaires and a stamped, self-addressed envelope. Please take a few minutes to complete the questionnaires. If you have completed and returned the first questionnaires in the last few days, please disregard this letter.

We are extremely interested in adding your response to the responses of other residents of your community. If you have any questions about the forms, please call 739-3356 between 8:00 a.m. and 4:30 p.m. and ask for Karen Peterson or Bill Sharff. Thank you for your cooperation.

Sincerely,

Gordon R Bopp

Gordon Bopp, Chairman
Regional Manpower Advisory Committee

Enclosures

GB/ks

EXHIBIT 35

SAMPLE TELEPHONE SCRIPT FOR CONTACTING NON-RESPONDENTS

TELEPHONE SCRIPT

1. My name is ______________________. I am calling from the office of the West Central Regional Development Commission. I would like to speak to (Name of person on household information sheet) ________________.

   If person taking call corresponds to the name on the household identification form continue with section 2 (below). If the identical person on the household ID form cannot be contacted, speak to another adult member of the household. Remember to repeat the first two sentences of Section I when another member of the household is contacted.

2. If an effort to offer relevant educational programs in your community, we are contacting a few households to find out what type of education is needed by the members of these households. Have you received the questionnaire which we recently sent you asking about your interest in more education?

   If respondent answers "yes" continue with section 3 below. If respondent answers "no", double check the listed address with responsent by asking "May I ask if you live at . (listed address) . . . ." *If respondent answers "no" to this question, apologize for the disturbance or any inconvenience you may have caused. If the respondent answers "yes" the listed address should be correct. You may continue the telephone interview with section 3 below.*

3. May I ask if you or any member of your household are interested in education for hobbies or special interest?

   If the respondent answers "yes" to this question, record the letter "Y" in the comment section of the household identification form, and place a slash (/) after the letter [e.g., Y/]. If the respondent answers "no", write the letter "N" and place the slash after the letter [e.g., N/]. If there are

EXHIBIT 35 (continued)

more than one adult member in the household, eleicit the response of each member to the above question. Record the response of each household member on a separate line. While recording the response, proceed to section 4.

DO NOT PAUSE TO RECORD RESPONSES.

4. "Are you or any members of your household interested in more job or employment related training?"

If the respondent answers "yes", write the letter "Y" next to the letter of the previous response. If the respondent answers "no" record the letter "N". For the person who responds "yes" to the first questions and "no" to the second, the information will be recorded in the comment section as follows: Y/N/. Remember to record the response of each household member on a separate line.

For each respondent who answered "yes" to any of the above questions, request that the questionnaires be returned in the envelopes that were enclosed with initial mailings, and thank the respondents for their cooperation. Use a colored marker to place an asterick next to the listed household where the party indicated that they will be returning the form. Proceed to section 5 for respondents who answered "no" to each of the above questions.

5. "I will make a note of that and fill out a form for you. For our records, may I ask your age . . . . Thank you very much".

Record the age next to the responses of the two previous questions. For a person of age 25, the information in the comment section will be coded as follows: N/N/25. When this information is obtained, indicate completion on the household identification form. If the respondent is hesitant to state his/her actual age, use age categoreis of 25, 35, 45, 55 and 65+.

3001511	3001521	3001531
Household Member 1	Household Member 2	Household Member 3

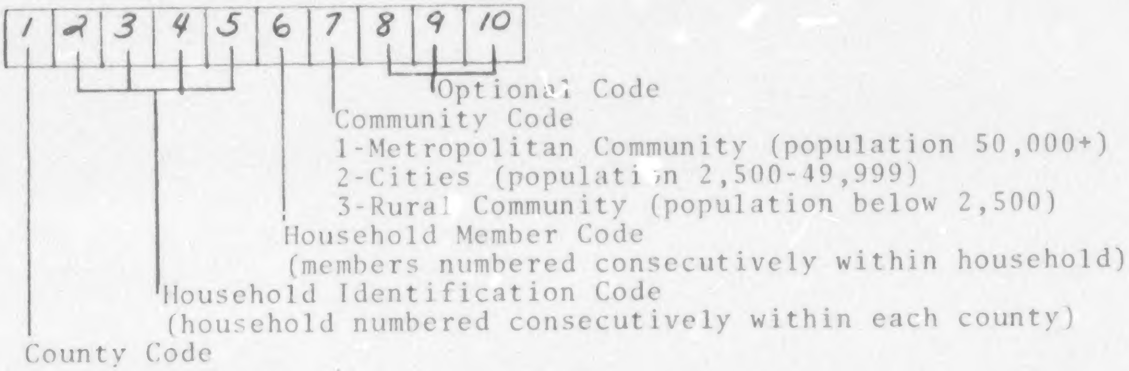
FRAME 2

for each household member can be identified by the number placed in the sixth column of each Identification Code.

The seventh digit of the Identification Code identifies the type of community. Three types of communities are suggested to be identified: (1) metropolitan communities, (2) cities, and (3) rural communities. A metropolitan community is defined for the purposes of this procedure, as one having a population larger than 50,000, and is coded "1" in the space for the seventh digit. A city is defined as having a population of above 2,500 and is coded "2". The Census Bureau provides "place" maps for the cities defined in this category. Areas with population below 2,500 are considered rural communities and the code "3" is used. Frame 1 illustrated coding for a household located in a city, while Frame 2 illustrated coding for a household located in a metropolitan community.

Ten columns are provided for the identification of selected segments of the population within a geographic area. Provisions have already been made to identify households within each county, individual responses from each household, and households in various size population centers. A total of seven digits (card columns) have been used to accomplish the necessary coding. The remaining three digits can be used by local project personnel in accordance with interests and needs.

The procedure for completing the Identification Code is summarized on the chart below.


1 2 3 4 5 6 7 8 9 10
Optional Code
Community Code
1-Metropolitan Community (population 50,000+)
2-Cities (population 2,500-49,999)
3-Rural Community (population below 2,500)
Household Member Code
(members numbered consecutively within household)
Household Identification Code
(household numbered consecutively within each county)
County Code

Section A: Age (Keypunch specific)

In this section of the questionnaire, respondents record their age in the space provided. The numbers should be punched in the 11th and 12th columns of the computer card. The card columns are indicated on the right side of each section.

A. What is your age? 19 years (11-12)

FRAME 3

For the information in Frame 3, '1' should be punched in column 11, and '9' should be punched in column 12.

Section B: Sex

The relevant code is placed in the box provided beside this section. If a male is indicated, the code "1" should be written in this box; if a female is indicated, the code "2" is used.

B. What is your sex? ✓ male ____ female (13)

FRAME 4

In the above frame (Frame 4), a male respondent is coded in the box to the right of the section.

Section C1: Present Occupation

In this section, the respondents state the job in which they are presently engaged. This statement is converted to a numerical three digit code to be placed in the three boxes to the right of this section (Frame 5). Code numbers are provided for each occupation in the "Alphabetical Index of Industries and Occupations" published by the United States Department of Commerce.

C. If you are working at present, what is your job? TRUCK DRIVER 7 0 5
(For example: teacher, farmer, secretary, homemaker) (14-16)

FRAME 5

This code number is determined by locating the occupation stated by the respondent in the alphabetical index for occupations. The corresponding three digit number is then recorded in the appropriate boxes.

In Frame 5, the respondent stated that he is presently working as a truck driver. The appropriate code as identified in the index is 705. This number is recorded in the boxes to the right of this section.

Section C2: Reason for Not Working (Keypunch specific)

There is a computer card column reserved for punching the code for each reason. The code '1' should be placed in the card column immediately to the right of the reason indicated. In Frame 6, a '1' should be punched in Column 19 of the computer key punch card. The number '1' should also be punched in Column 21.

If you are not working at present or are working less time than desired, what is the reason? Check all that apply.

_____ 1. In school (17)
_____ 2. Retired (18)
__✓__ 3. Cannot find more work (19)
_____ 4. Do not want more work (20)
__✓__ 5. Other reason, explain: ______________________________ (21)

FRAME 6

Section D: Reason For More Education For Hobbies and Special Interests

In this section, there are four responses, but only one response is desired. The number of the indicated response is placed in the box to the right of this section. In the example below (Frame 7), general self-improvement is the reason indicated for desiring more education. The code for this reason is placed in the appropriate box.

D. Do you want more education for hobbies or special interests for any of the following reasons? Check the one most important reason or check "do not want." $\boxed{3}$ (22)

_____ 1. Better use of my leisure time.
_____ 2. Save money by doing it myself.
__✓__ 3. General self-improvement.
_____ 4. Do not want more education for hobbies or special interests (skip question E, go to F).

FRAME 7

Section E1: Broad Program Choice For More Education For Hobbies and Special Interests

In this section, the respondent indicates a first, second, and third choice of the program categories. The number of the first choice is placed in the box designated for Column 23, the number of the second choice is placed in the box for Column 24, and the number of the third choice is placed in the box for Column 25. In the example below (Frame 8), the first, second, and third choices are Technical, Recreation, and Music, respectively. The respondent's choices are coded in the appropriate boxes.

E. For the reason checked in Question D above, what type of programs would you like? Indicate your first choice with a "1," your second choice with a "2," and your third choice with a "3."

	1.	Basic skills (examples: refresher math, basic English)	6
3	2.	Arts and crafts (examples: oil painting, art, leather tooling)	(23)
	3.	Music (examples: guitar, banjo, piano)	
2	4.	Recreation (examples: camping, bridge, dancing)	4
	5.	Home skills (examples: quilting, flower arrangement, gourmet cooking)	(24)
1	6.	Technical (examples: home remodeling, auto repair, plumbing, electrical wiring)	
	7.	Liberal (examples: history, economics, foreign language)	2
	8.	Other type, explain: ________	(25)

FRAME 8

Section E2: Specific Program Choice For More Education For Hobbies and Special Interests

In this section, the respondent describes the actual topic in mind when the first choice was indicated. The actual topic is converted into a numeric three digit code. The appropriate code is found in the "Program Category" code listing shown in Appendix VI. In the example below (Frame 9), the respondents indicated a primary interest in leather carving. Leather carving is coded 212 under the "Arts and Crafts" section. The appropriate code is placed in the boxes to the left of this section.

IMPORTANT

For the choice checked "1" in Question E above, describe in detail the actual topic you had in mind. Examples: refresher math, guitar, plumbing, history.

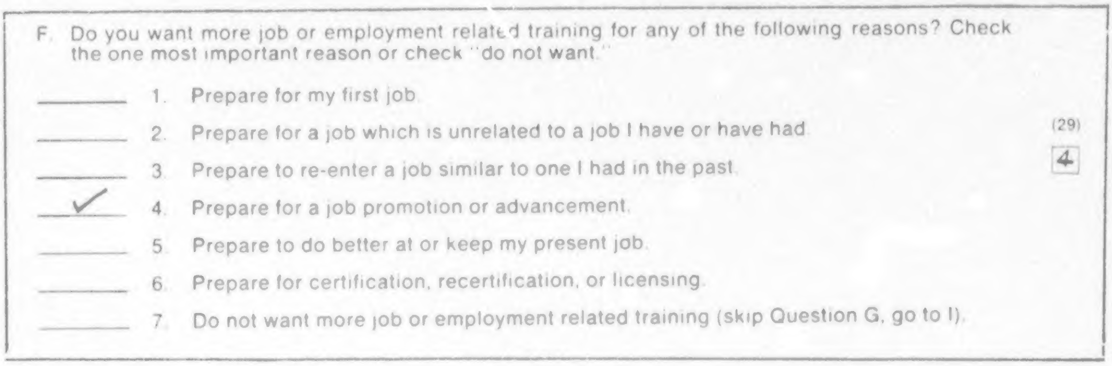
LEATHER CARVING 2 1 2
(26-28)

FRAME 9

If the desired interest area is not found in the code listing, then this specific area of interest should be added to the appropriate category and given the succeeding code number.

Section F: Reason For More Education For Job Training

In this section, the respondent indicates the most important reason for needing job related training. A check in response 7 indicates that such training is not needed. The number corresponding to the reason checked is placed in the box to the right of this section. In the example below (Frame 10), the reason indicated is to prepare for job promotion or advancement. The number for this reason is coded in the designated box.



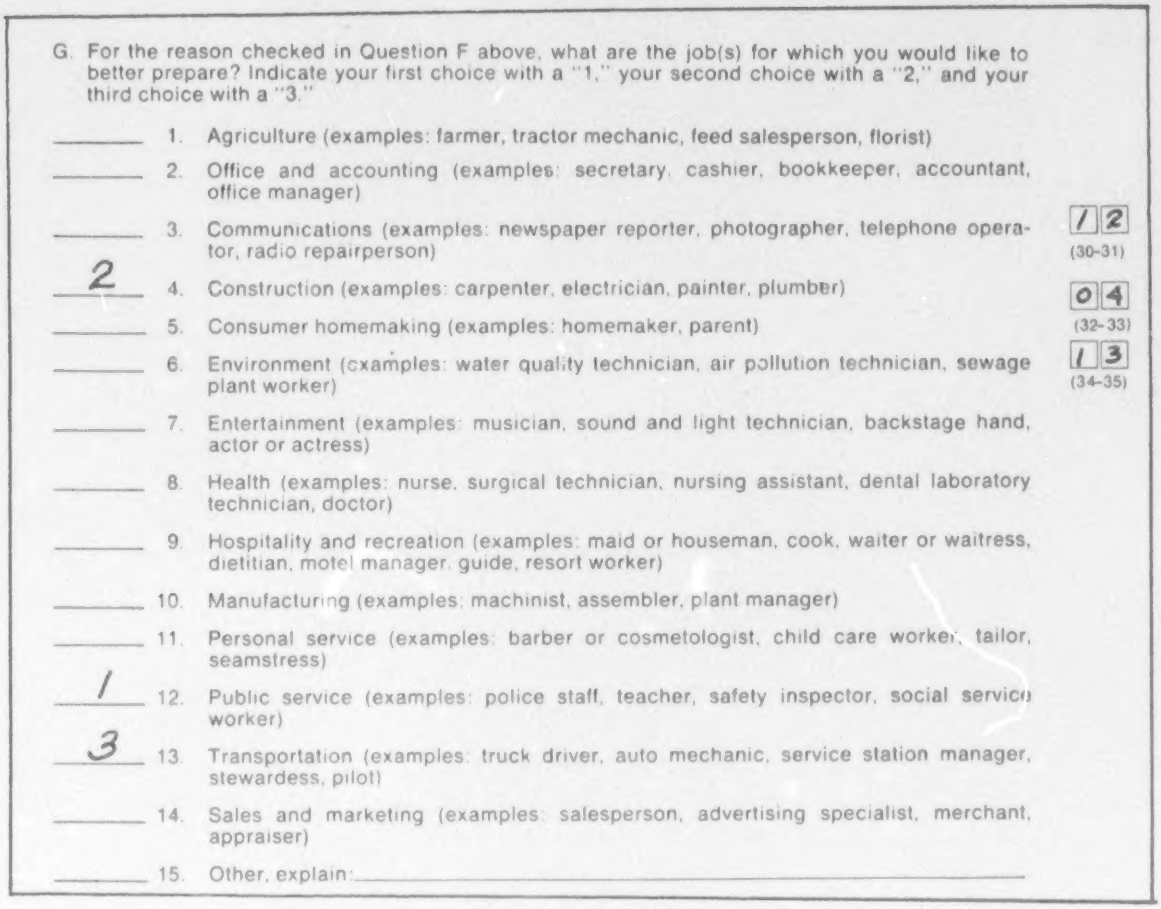
F. Do you want more job or employment related training for any of the following reasons? Check the one most important reason or check "do not want."

______ 1. Prepare for my first job.
______ 2. Prepare for a job which is unrelated to a job I have or have had. (29)
______ 3. Prepare to re-enter a job similar to one I had in the past. $\boxed{4}$
✓ 4. Prepare for a job promotion or advancement.
______ 5. Prepare to do better at or keep my present job.
______ 6. Prepare for certification, recertification, or licensing.
______ 7. Do not want more job or employment related training (skip Question G, go to I).

FRAME 10

Section G1: General Program Choice For More Education For Job Training

In this section, the respondent indicates a first, second, and third choice of job categories. The number of the first choice is placed in the box assigned to Columns 30 and 31, the number of the second choice is placed in the assigned box to Columns 32 and 33, and the number of the third choice is placed in the box assigned to Columns 34 and 35. In the example below (Frame 11), the first choice is the public service category, the second choice is the construction category, and the third choice is the transportation category. These choices are coded in the appropriate boxes.



G. For the reason checked in Question F above, what are the job(s) for which you would like to better prepare? Indicate your first choice with a "1," your second choice with a "2," and your third choice with a "3."

______ 1. Agriculture (examples: farmer, tractor mechanic, feed salesperson, florist)

______ 2. Office and accounting (examples: secretary, cashier, bookkeeper, accountant, office manager)

______ 3. Communications (examples: newspaper reporter, photographer, telephone operator, radio repairperson)

__2__ 4. Construction (examples: carpenter, electrician, painter, plumber)

______ 5. Consumer homemaking (examples: homemaker, parent)

______ 6. Environment (examples: water quality technician, air pollution technician, sewage plant worker)

______ 7. Entertainment (examples: musician, sound and light technician, backstage hand, actor or actress)

______ 8. Health (examples: nurse, surgical technician, nursing assistant, dental laboratory technician, doctor)

______ 9. Hospitality and recreation (examples: maid or houseman, cook, waiter or waitress, dietitian, motel manager, guide, resort worker)

______ 10. Manufacturing (examples: machinist, assembler, plant manager)

______ 11. Personal service (examples: barber or cosmetologist, child care worker, tailor, seamstress)

__1__ 12. Public service (examples: police staff, teacher, safety inspector, social service worker)

__3__ 13. Transportation (examples: truck driver, auto mechanic, service station manager, stewardess, pilot)

______ 14. Sales and marketing (examples: salesperson, advertising specialist, merchant, appraiser)

______ 15. Other, explain: ______________________________

1 2
(30-31)

0 4
(32-33)

1 3
(34-35)

FRAME 11

Section G2: Specific Program Choice For More Education For Job Training

In this section, the respondent explains in detail the actual job in mind for the category in which a first choice was indicated. This explanation is converted to a numeric three digit code to be placed in the three boxes to the right of this section. Code numbers are provided for each job in the "Alphabetical Listing of Industries and Occupations" mentioned for Section C1. The code number is determined by locating the occupation stated by the respondent in the occupational index. The corresponding three digit number is then recorded in the appropriate boxes. In the example below (Frame 12), the respondent indicates a training need to become a game warden in a game refuge. The number corresponding to game warden in the occupational index is 245. This number is recorded in the three boxes to the right of this section.

IMPORTANT

For the group of jobs checked "1" in Question G, describe in detail the actual job you had in mind for which more training is desired. Examples: secretary, carpenter, farmer, registered nurse.

GAME WARDEN IN A GAME REFUGE ______ 2 4 5

(36-38)

FRAME 12

Section H: Attendance Time (Keypunch specific)

This section elicits the most convenient time for the respondent to attend an educational program. The number "1" is punched in the columns corresponding to the responses checked. One card column is reserved for each of the three responses.

In the illustration below, the respondent checked responses two and three. The numeral 1 is punched in Columns 40 and 41.

H. When could you attend an educational program? Check as many as you can.

______ 1. Day (Monday-Friday) (39)

✓ 2. Night (Monday-Friday) (40)

✓ 3. Weekends (41)

FRAME 13

Section I: Obstacles To Attendance (Keypunch specific)

In this section, the respondent checks some of the most important problems which may prevent attending an educational program. The number '1' is punched in the column corresponding to the responses checked. One card column is reserved for each response with the exception of the first response for which three card columns are reserved. If the first response is checked, a '1' is punched in the 42nd column. The respondents would also indicate the distance they are willing to travel. The identical two-digit number is punched in Columns 43 and 44. If the distance is indicated with a one digit number, a zero (0) is punched in Column 43 and the digit indicated is punched in Column 44. This is illustrated in the frame below (Frame 14). The numeral '1' is punched in Columns 42, 48, and 49. An "09" is punched in Columns 43 and 44.

I. What are some of the most serious problems that may prevent you from attending an educational program? Check all that usually apply to you.

✓	1.	Program not available in local area. How far would you travel? 9 miles	(42) (43-44)
____	2.	Program not available at convenient time.	(45)
____	3.	Could not meet admission requirements.	(46)
____	4.	Costs of attending are too high.	(47)
✓	5.	Present job does not allow time.	(48)
✓	6.	Family obligations (e.g., child care) do not allow time.	(49)
____	7.	More training would not raise my income.	(50)
____	8.	Have no transportation.	(51)
____	9.	I never hear about programs being offered and I don't know where to find out.	(52)
____	10.	Other, explain: ____________	(53)

FRAME 14

Section J: Need For Counseling Service (Keypunch specific)

In this section, it is indicated whether the respondent needs help in deciding what kind of further education is needed. If the respondent checks 'yes', a '1' is punched in Column 54. If 'no' is checked, a '2' is placed in this column. This is illustrated in the frame below. Since the respondent checked 'no', the numeral '2' is punched in Column 54.

J. Would you like help in deciding what type of further education or job training you need? (54)

____ yes ✓ no

FRAME 15

Section "J" is the last section to be coded. Having coded this section, the previous sections should be double checked to insure that they were correctly coded. Where there are no responses given to questions by the respondents, the boxes in which coding is required should be left blank. The coded questionnaire is then placed in a three ring binder to be submitted with the batch of questionnaires for data analysis. Both complete and incomplete questionnaires will be used for data analysis.

CHAPTER V

ANALYSIS AND SUMMARY OF COLLECTED DATA

This chapter provides an explanation of the summary tables which result from the analysis of the data contained on the returned questionnaires. Each of 20 summary tables is presented as an exhibit and accompanied by an explanation. The set of 20 tables can be provided for all respondents as well as sub-groups of respondents (e.g., by county, age group, sex, occupational status, program interest). The actual numbers shown in the tables are from the study in Economic Development Region 4 in Minnesota.

TABLE 1. AGE

The first table (see Exhibit 36) presents the age distribution of the sample. The ages are placed in seven age categories, and respondents who complete the questionnaire but did not indicate their ages are placed in the "not reported" section beneath the age categorization. For each age group, the number in the sample and the percentage of those reported are presented. The column entitled "number in sample", indicates the number of respondents falling within a particular age group. The column entitled "percent of reported" summarizes age groupings as a

EXHIBIT 36

SUMMARY TABLE ON AGE

Table 1

AGE GROUP	NUMBER IN SAMPLE	PERCENT OF REPORTED
20	103	2.76
20 - 29	441	11.81
30 - 39	535	14.33
40 - 49	586	15.70
50 - 59	761	20.39
60 - 69	895	23.98
69	412	11.04
Not Reported	1	-----
TOTAL	3,734	100.0

percentage of those respondents reporting their ages. Note in this table that only those responding to some part of the questionnaire are included; those who did not return a questionnaire or returned blank questionnaires are excluded from the table.

TABLE 2. SEX

This table (see Exhibit 37) presents the distribution of individuals of each sex. The "number in sample" column is a count of individuals in each category, while the other column reports percentages based on the total number of respondents who indicated their sex.

EXHIBIT 37

SUMMARY TABLE ON SEX

Table 2

SEX	NUMBER IN SAMPLE	PERCENT OF REPORTED
Male	1,735	46.80
Female	1,972	53.20
Not Reported	27	-----
TOTAL	3,734	100.0

TABLE 3. PRESENT OCCUPATION

This table (see Exhibit 38) presents information relative to the type of occupation held by the persons responding to the questionnaire. Occupations are classified into major groupings. For the major groupings, the number of respondents whose occupation was coded into a major grouping, and the percentages of total respondents reporting their occupation are reported; however, only the number in the sample is reported for each specific occupation within these major groupings. The categories used for this table are the same as those categories used by the U.S. Bureau of Census.

EXHIBIT 38

SUMMARY TABLE ON PRESENT OCCUPATION

Table 3

OCCUPATION	NUMBER IN SAMPLE	PERCENT OF REPORTED
Professonal, Technical, and Kindred Workers	195	13.21
Accountants	9	
Electrical and Electronic Engineers	1	
Engineers, N.E.C.	6	
Foresters and Conservationists	2	
Lawyers	1	
Librarians	2	
Statisticians	1	
Chemists	1	
Personnel and Labor Relations Workers	3	
Chiropractors	2	
Dentists	3	
Pharmacists	3	
Physicians, Medical and Osteopathic	17	
Registered Nurses	15	
Therapists	5	
Clinical Laboratory Technologists & Technicians	1	
Health Technologists and Technicians, N.E.C.	1	
Clergymen	2	
Economists	2	
Urban and Regional Planners	1	
Social Workers	6	
Recreation Workers	1	
Physics Teachers	1	
Engineering Teachers	1	
Art, Drama, & Musci Teachers	1	
Coaches and Physcial Education Teachers	1	
Teachers, College & University Subject Not Spec.	23	
Adult Education Teachers	5	
Elementary School Teachers	1	
PreKindergarten & Kindergarten Teachers	1	
Secondary School Teachers	4	
Teachers, Except College & University, N.E.C.	54	
Electrical & Electronic Engineering Technicians	1	
Mechanical Engineering Technicians	1	
Surveyors	1	
Engineering & Science Technicians, N.E.C.	2	
Airplane Pilots	1	
Technicians, N.E.C.	2	
Vocational & Educational Counselors	1	
Authors	1	
Designers	1	
Musicians & Composers	2	
Painters & Sculptors	2	

EXHIBIT 38 (CONTINUED)

OCCUPATION	NUMBER IN SAMPLE	PERCENT OF REPORTED
Professional, Technical, and Kindred Workers (cont)		
Photographers	1	
Public Relations Men & Publicity Writers	2	
Managers and Administrators, Except Farm	106	7.18
Assessors, Controllers, Treasurers; Public Admin.	2	
Bank Officers & Financial Managers	8	
Buyers & Shippers, Farm Products	4	
Buyers, Wholesale & Retail Trade	1	
Health Administrators	8	
Inspectors, except Construction, Public Admin.	1	
Managers & Superintendents, Building	2	
Officials & Administrators; Public Admin, N.E.C.	3	
Postmaters & Mail Superintends	2	
Purchasing Agents & Buyers, N.E.C.	2	
Restaurant, Cafeteria, & Bar Managers	3	
Sales Managers & Department Heads, Retail Trade	2	
Sales Managers, Except Retail Trade	2	
School Administrators, Elementary & Secondary	2	
Managers & Administrators, N.E.C.	64	
Sales Workers	45	3.05
Hucksters & Peddlers	2	
Insurance Agents, Brokers, & Underwriters	6	
Real Estate Agents & Brokers	3	
Salesmen & Sales Clerks, N.E.C.	34	
Clerical and Kindred Workers	124	8.40
Bank Tellers	4	
Bookkeepers	13	
Cashiers	5	
Clerical Supervisors, N.E.C.	1	
Counter Clerks, Except Food	6	
Enumerators & Interviewers	1	
Insurance Adjusters, Examiners, & Investigators	2	
Mail Carriers, Post Office	2	
Mail Handlers, except Post Office	1	
Computer & Peripheral Equipment Operators	1	
Key Punch Operators	2	
Postal Clerks	3	
Proofreaders	1	
Receptionists	4	
Secretaries, Medical	2	
Secretaries, N.E.C.	49	
Shipping & Receiving Clerks	6	
Statistical Clerks	2	

EXHIBIT 38 (CONTINUED)

OCCUPATION	NUMBER IN SAMPLE	PERCENT OF REPORTED
Clerical and Kindred Workers (continued)		
Stock Clerks & Storekeepers	1	
Teacher Aides, except School Monitors	3	
Typists	1	
Miscellaneous Clerical Workers	2	
Not Specified Clerical Workers	12	
Craftsmen and Kindred Workers	86	5.83
Bakers	2	
Blacksmiths	2	
Carpenters	16	
Carpet Installers	1	
Cement & Concrete Finishers	1	
Compositors & Typesetters	1	
Cranemen, Derrickmen, & Hoistmen	2	
Decorators & Window Dressers	1	
Electricians	7	
Electric Power Linemen & Cablemen	1	
Excavating, Grading, Road Machine Op; exc. Bulldozer	4	
Foreman, N.E.C.	5	
Jewlers & Watchmakers	2	
Machinists	1	
Air Conditioning, Heating, & Refrigeration Mech.	1	
Aircraft Mechanics	2	
Automobile Body Repairmen	1	
Automobile Mechanics	7	
Heavy Equipment Mechanics, Incl. Diesel	4	
Household Appliance-Accessory Installers, Mechanic	7	
Railroad & Car Shop Mechanics	1	
Miscellaneous Mechanics & Repairmen	1	
Painters, Construction & Maintenance	2	
Photoengravers & Lithographers	1	
Plumbers & Pipe Fitters	6	
Stationary Engineers	1	
Stone Cutters & Stone Carvers	1	
Telephone Installers & Repairmen	3	
Upholsterers	1	
Former Members of the Armed Forces	1	
Operatives, Except Transportation	45	3.05
Assemblers	3	
Checkers, Examiners, & Inspectors; Manufacturing	2	
Dressmakers 7 Seamstresses, Except Factory	4	
Graders & Sorters, Manufacturing	1	
Laundry & Dry Cleaning Operatives, N.E.C.	3	
Meat Cutters & Butchers, exc. Manufacturing	1	

EXHIBIT 38 (CONTINUED)

OCCUPATION	NUMBER IN SAMPLE	PERCENT OF REPORTED
Operatives, except Transportation (continued)		
Meat Cutters & Butchers, Manufacturing	7	
Mine Operatives, N.E.C.	1	
Packers & Wrappers, exc. Meat & Produce	4	
Photographic Process Workers	1	
Sewers & Stichers	4	
Stationary Firemen	3	
Textile Operatives, N.E.C.	1	
Selders & Flame-Cutters	3	
Machine Operatives, Miscellaneous Specified	3	
Machine Operatives, Not Specified	2	
Not Specified Operatives	2	
Transportation Equipment Operatives	16	1.08
Bus Driver	2	
Deliverymen & Routemen	6	
Fork Lift & Tow Motor Operatives	1	
Truck Drivers	7	
Laborers, except Farm	47	3.18
Construction Laborers, exc. Carpenters' Helpers	20	
Freight & Material Handlers	2	
Garbage Collectors	1	
Gardeners & Groundskeepers, exc. Farm	1	
Longshoremen & Stevedores	4	
Lumbermen, Raftsmen, & Woodchoppers	2	
Stock Handlers	4	
Warehousemen, N.E.C.	2	
Miscellaneous Laborers	4	
Not Specified Laborers	7	
Farmers and Farm Managers	227	15.38
Farmers (Owners & Tenants)	227	
Farm Laborers and Farm Foremen	22	1.49
Farm Foremen	4	
Farm Laborers, Wage Workers	13	
Farm Laborers, Unpaid Family Workers	4	
Farm Service Laborers, Self-Employed	1	
Service Workers, except Private Household	559	37.87
Cleaners & Charwomen	6	
Janitors & Sextons	16	
Bartenders	4	
Cooks, exc. Private Household	6	
Food Counter & Fountain Workers	3	

EXHIBIT 38 (CONTINUED)

OCCUPATION	NUMBER IN SAMPLE	PERCENT OF REPORTED
Service Workers, except Private Household (cont)		
Food Service Workers, N.E.C., exc. Private Household	2	
Dental Assistants	3	
Health Aides, exc. Nursing	1	
Nursing Aides, Orderlies, & Attendants	4	
Practical Nurses	16	
Attendants, Recreation & Amusement	1	
Attendants, Personal Service, N.E.C.	2	
Barbers	1	
Bootblacks	1	
Child Care Workers, exc. Private Household	7	
Hairdressers & Cosmetologists	1	
Housekeepers, exc. Private Household	3	
Welfare Service Aides	478	
Firemen, Fire Protection	2	
Guards & Watchmen	2	
Private Household Workers	4	.27
Child Care Workers, Private Household	2	
Laundresses, Private Household	1	
Maids & Servants, Private Household	1	
TOTAL	1,476	100.00

TABLE 4. EMPLOYMENT STATUS

The questionnaire requests respondents who are working to state their present occupation, and if not working or working less than desired, to indicate reasons why. Those respondents stating their present occupation and not indicating reasons for working less than desired are considered as working as much as desired, and the numbers and percentages of this occurrance are presented in the first line of Table 4 (see Exhibit 39). Those respondents stating their present occupation, but also indicating reasons for working less time than desired, were considered as individuals working less than desired, and the number and percentages are presented in the second line of the table. Respondents who did not state an occupation and indicated they could not find work, are shown in the third line of the table; these can be considered the unemployed. Respondents who did not state an occupation, but indicated reasons for not working other than cannot find work are shown in the fourth line of the table. The total row indicates the number of respondents who completed this section of the questionnaire; percentages reported in the table are based on this total.

EXHIBIT 39

SUMMARY TABLE ON EMPLOYMENT STATUS

Table 4

STATUS	NUMBER IN SAMPLE	PERCENT
Working as much as desired	965	44.41
Working less than desired	511	23.52
Not working and cannot find work	29	1.33
Not working, other reasons	558	30.74
TOTAL	2,173	100.00

TABLE 5. REASON FOR NOT WORKING OR WORKING LESS THAN DESIRED

To be included in this summary table (see Exhibit 40), respondents must have indicated which of four reasons accounted for their not working or working less time than desired. Since it is possible that the listed reasons do not encompass the universe of reasons, a section is provided on the questionnaire to state other reasons. The occurrance of other reasons is also summarized. Because respondents were asked to list as many reasons as possible, the "number in sample" column summarizes the number of individuals checking each category, and the percentages are based on the total number of individuals who responded to this question. The total number of individuals who responded to this question (not the same as the number of responses) is shown in the total row.

EXHIBIT 40

SUMMARY TABLE ON REASON FOR NOT WORKING
OR WORKING LESS THAN DESIRED

Table 5

REASON	NUMBER IN SAMPLE	PERCENT
In school	66	5.48
Retired	477	39.59
Cannot find work	65	5.39
Do not want work	519	43.07
Other Reason	221	18.34
TOTAL	1,205[a]	

[a] This sum represents the number of respondents. It is not the sum of the column since multiple responses were accepted.

TABLE 6. NEED FOR EDUCATION FOR HOBBIES OR SPECIAL INTERESTS

Respondents were asked to indicate on the questionnaire whether they want more education for hobbies or special interest. Table 6 (see Exhibit 41) summarizes the responses to this question. As for previous tables, the number of respondents in the sample and the related percentages of total responses are presented for the "yes" and "no" responses. Also as previously noted, the total "number in sample" includes only those respondents who completed this item on the questionnaire and returned the questionnaire; excluded are those not returning questionnaires and those who returned questionnaires but did not complete this item.

EXHIBIT 41

SUMMARY TABLE ON NEED FOR MORE EDUCATION
FOR HOBBIES AND SPECIAL INTERESTS

Table 6

NEED	NUMBER IN SAMPLE	PERCENT	POPULATION ESTIMATE
Yes	947	16.11	18,608
No	4,931[a]	83.89	96,901
TOTAL	5,878	100.00	115,509

[a] This is an estimate based on the assumption that all persons in the sample who did not responde to the assessment questionnaire did not want more education for hobbies and special interests, and an assumption that there was an average of 1.6 persons per houshold over 18 years of age in the West Central Development Region.

A new feature of this summary table and the tables which follow, when compared to previous tables, is a column labeled "Population Estimate". The numbers in this column represent an estimate of the number of the total population of the selected geographic area who would fit each category of response (i.e., "yes" and "no" in this table). Estimates are made from the most conservative position relative to the number estimated to be interested in more education; this is accomplished by assuming that all individuals in the sample who did not return a questionnaire or did not complete the relevant question on the questionnaire would not be interested in more education. In Table 6, all non-respondents were assumed to have indicated "no" additional education for hobbies or special interests was desired. The basis for the conservative assumption is that it was felt that those who were interested in more education would take time to complete and return the questionnaire.

TABLE 7. REASON FOR WANTING MORE EDUCATION (HOBBIES/SPECIAL INTERESTS)

Respondents were requested to check one of three reasons for needing education relating to hobbies and special interests, or to indicate that this type of education is not needed. This table (see Exhibit 42) summarizes the numbers of responses, percentages of total responses, and population estimates for each reason listed. The population estimates in this table are based on the projected total number of people in the region needing more education in hobbies and special interest; this projected total is the population estimation of the "yes" respondents in Table 6.

EXHIBIT 42

SUMMARY TABLE ON REASON FOR WANTING MORE EDUCATION
FOR HOBBIES AND SPECIAL INTERESTS

Table 7

REASON	NUMBER IN SAMPLE	PERCENT	POPULATION ESTIMATE
Better use of leisure	204	21.54	4,008
Save money	241	25.45	4,735
Self-improvement	502	53.01	9,865
TOTAL	947	100.00	18,608

TABLE 8. PROGRAMS FOR HOBBIES AND SPECIAL INTERESTS (SAMPLE INFORMATION)

Programs for hobbies and special interests are categorized into seven program areas, and respondents choose the three program areas in which they are most interested. Table 8 (see Exhibit 43) shows a summary of the respondents' choices. For each program area, the number in the sample and its related percentage are indicated for the first, second, and third choices. The percentages for each choice are based on the total number of responses for that choice only.

The column entitled "Sample PCT" indicates the percentage of the total sample having an interest in each program area. Percentages in this column do not differentiate between levels of interest; each level of choice is weighted the same. However, the column entitled "Weight PCT" exhibits weighted percentages for each program area having taken into consideration varying levels of interest. To calculate the "Weight PCT", the first choice is given a weight of 3, the second choice a weight of 2, and the third choice a weight of 1. The number in each program area for each choice is multiplied by the weight for the respective choice, while the totals for each choice is also multiplied by the respective weight. The sum of the weighed number for each program is divided by the sum of the weighed totals for each choice. When this is multiplied by 100, a weighed percentage is obtained for each program.

EXHIBIT 43

SUMMARY TABLE ON GENERAL PROGRAM INTEREST
FOR HOBBIES AND SPECIAL INTERESTS FOR SAMPLE

Table 8

	FIRST CHOICE		SECOND CHOICE		THIRD CHOICE		
PROGRAM AREA	NO. IN SAMPLE	PCT	NO. IN SAMPLE	PCT	NO. IN SAMPLE	PCT	WEIGHT PCT
Basic Skills	54	5.88	40	6.41	36	8.37	6.27
Arts and Crafts	199	21.65	131	20.99	59	13.72	20.70
Music	52	5.66	66	10.58	55	12.79	7.73
Recreation	90	9.79	106	16.99	90	20.93	12.90
Home Skills	157	17.08	123	19.71	73	16.98	17.81
Technical	294	31.99	96	15.38	62	14.42	25.61
Liberal	71	7.73	61	9.78	55	12.79	8.79
Other	2	.22	1	.16	0	.00	.19
TOTAL	919	100.00	624	100.00	430	100.00	100.00

TABLE 9. PROGRAMS FOR HOBBIES AND SPECIAL INTEREST (POPULATION ESTIMATE)

This table (see Exhibit 44) is an extension of Table 8. For each program area, there is an estimate of the actual number of people in the region who falls under each of the three levels of choice. These population estimates are based on the total number of people indicating a need for more education in the area of hobbies and special interests, as shown in Table 6.

TABLE 10. COURSES OF INTEREST FOR HOBBIES AND SPECIAL INTERESTS

The specific courses desired in each program area are exhibited in Table 10 (see Exhibit 45). The number of responses,

EXHIBIT 44

SUMMARY TABLE ON GENERAL PROGRAM INTEREST
FOR HOBBIES AND SPECIAL INTERESTS FOR POPULATION

Table 9

PROGRAM AREA	POPULATION ESTIMATE FIRST CHOICE	POPULATION ESTIMATE SECOND CHOICE	POPULATION ESTIMATE THIRD CHOICE
Basic skills	1,060	785	707
Arts and crafts	3,909	2,573	1,159
Music	1,021	1,296	1,081
Recreation	1,767	2.082	1,767
Home Skills	3,085	2.417	1,434
Technical	5,777	1,886	1,218
Liberal	1,395	1,198	1,081
Other	39	20	0
TOTAL	18,053	12,257	8,447

and the related percentages of total responses are reported for each major program area; but only the number of responses is reported for specific courses within program areas.

TABLE 11. NEED FOR JOB TRAINING

Respondents were asked to indicate on the questionnaire whether they need any additional job training for several different reasons (see Exhibit 5). Respondents either selected a reason for more job training or indicated that they did not want more education for job preparation. Those indicating a reason for more job training are categorized in the "yes" category in Table 11 (see Exhibit 46); those indicating no desire for more job training are categorized in the "no" category. The first two columns show the number of respondents and the percentage of total respondents in each category. The last column, "Population Estimate", provides an estimate of the number of individuals in the population who would fall in each category as was done in Table 6. Again a conservative estimate is made of the number in the "yes" category by assuming all those who did not respond to the questionnaire or to this particular item were not interested in additional job training.

EXHIBIT 45

SUMMARY TABLE OF SPECIFIC COURSES OF INTEREST FOR HOBBIES AND SPECIAL INTERESTS

Table 10

PROGRAM AREA	NUMBER IN SAMPLE	PERCENT OF REPORTED
Basic Skills	13	2.30
Adult Basic Education	6	
Basic Math	7	
Arts and Crafts	99	17.52
Crocheting	6	
Decoupage	2	
Jewelry Making	1	
Knitting	2	
Macrame	5	
Needlepoint	9	
Norweigian Harbinger Embroidery	1	
Oil and Acrylic Painting	23	
Pottery	2	
Quilting	2	
Rug Hooking	2	
Rya Technique	2	
Sculptures with Salt Dough	1	
Wood Carving	7	
Ceramics	10	
Theatre	1	
Arts & Crafts for Profit	11	
Leather Tooling	6	
Water Color Painting	3	
Rosemaling	3	
Music	46	8.14
Banjo	2	
Ear Training	2	
Fundamentals of Music	1	
Guitar	22	
Piano	15	
Voice Training	2	
Dance, Ballet, Other Than Ballroom	1	
Organ	1	
Recreation	63	11.15
Ballroom Dance	4	
Basketball	1	
Bowling	1	
Camping	15	
Canoeing	3	
Curling	1	
Figure Skating	11	

EXHIBIT 45 (CONTINUED)

PROGRAM AREA	NUMBER IN SAMPLE	PERCENT OF REPORTED
Recreation (continued)		
Fishing	1	
Golf	4	
Gymnastics	1	
Hiking	1	
Hunting	2	
Judo	1	
Karate	1	
Sailing	1	
Scuba and Skin Diving	1	
Skiing	3	
Slimnastics	1	
Swimming	2	
Tennis	2	
Track and Field	1	
Volleyball	1	
Yoga	1	
Sports, Outdoor	3	
Home Skills	54	9.56
Cake Decorating	5	
French Cuisine	1	
Main Dish Cookery	2	
Sewing	18	
Any Home Skills	10	
Quilting	7	
Flower Arrangement	9	
Cooking	1	
Patchwork	1	
Technical	216	38.23
Adult Driver Education	1	
Auto Mechanics	31	
Basic Pattern Design	1	
Bookkeeping	4	
Clothing Construction	1	
First Aid and Pre-Med Safety	2	
Gourmet Cookery	6	
Income Tax Preparation	5	
Interior Decorating	6	
Photography	1	
Refinishing Furniture	4	
Sewing Lingere, Knit Fabrics	1	
Shorthand	7	
Upholstery	1	
Woodworking	15	

EXHIBIT 45 (CONTINUED)

PROGRAM AREA	NUMBER IN SAMPLE	PERCENT OF REPORTED
Technical (continued)		
Welding	4	
Wiring, Electrical	14	
Carpentry	9	
Home Remodeling & Repair	56	
Communication	1	
Business Administration	2	
Electronics	3	
Small Engine Repair	9	
Plumbing	10	
Fire Science	1	
Typing	4	
Graphic Arts	2	
Transcendential Meditation	1	
Masonry	3	
Grain Inspector	3	
Tractor Mechanic	5	
Business Skills (refresher)	1	
Caring for Animals	1	
Nursing	1	
Liberal	74	13.10
Accounting	2	
American Indian Studies	1	
American Studies	1	
Anatomy	1	
Arts, Studio	13	
Business Administration	3	
Chicano Studies	1	
Child Psychology	3	
Economics	1	
English	6	
Family Social Science	2	
German	1	
History	5	
International Relations	2	
Mathematics	8	
Norwegian	2	
Philosophy	1	
Swedish	1	
Spanish	5	
Speech Communications	1	
Speed Reading	2	
Electronics	2	
Vocational Certified	1	
Remedial Reading	1	

EXHIBIT 45 (CONTINUED

PROGRAM AREA	NUMBER IN SAMPLE	PERCENT OF REPORTED
Liberal (continued)		
Estate and Financial Planning	1	
World History	1	
Education	2	
Photography	2	
Writing	2	
TOTAL	565	100.00

EXHIBIT 46

SUMMARY TABLE ON NEED FOR MORE JOB TRAINING

Table 11

NEED	NUMBER IN SAMPLE	PERCENT	POPULATION ESTIMATE
Yes	639	10.87	12,555
No	5,239[a]	89.13	102,954
TOTAL	5,878	100.00	115,509

[a] This is an estimate based on the assumption that all persons in the sample who did not respond to the assessment questionnaire did not want more education for job training, and an assumption that there was an average of 1.6 persons per household over 18 years of age in the West Central Region.

TABLE 12. REASON FOR WANTING JOB TRAINING

Respondents were requested to check one of six reasons for wanting more job training, or to indicate that no job training is needed. This table (see Exhibit 47) summarizes

EXHIBIT 47

SUMMARY TABLE ON REASON FOR WANTING MORE EDUCATION FOR JOB TRAINING

Table 12

REASON	NUMBER IN SAMPLE	PERCENT	POPULATION ESTIMATE
First Job	72	11.27	1,415
Retrain	134	20.97	2,633
Re-enter	66	10.33	1,297
Promotion	112	17.53	2,200
Update	162	25.35	3,183
Certification	93	14.55	1.827
TOTAL	3,623	100.00	12,555

the number of respondents in the sample checking each reason for more training, and the percentages and population estimates calculated for each reason. The population estimates are based on the total number of people indicating a need for more job training as shown in the "yes" row of Table 11.

TABLE 13. JOB GROUP FOR WHICH TRAINING IS WANTED (SAMPLE INFORMATION)

Jobs are categorized into 14 major job groups, and respondents choose the three major job groups for which training was desired. For each major job group, the number in the sample and its related percentage are indicated for the first, second, and third choices in Table 13 (see Exhibit 45). The percentages for each choice are based on the total number of responses for that choice alone.

EXHIBIT 48

SUMMARY TABLE ON GENERAL PROGRAM INTEREST
FOR JOB TRAINING FOR SAMPLE

Table 13

JOB GROUP	FIRST CHOICE NO. IN SAMPLE	FIRST CHOICE PCT	SECOND CHOICE NO. IN SAMPLE	SECOND CHOICE PCT	THIRD CHOICE NO. IN SAMPLE	THIRD CHOICE PCT	WEIGHT PCT
Agriculture	89	15.32	19	5.64	13	5.49	11.98
Office and Accounting	108	18.59	54	16.02	22	9.28	17.11
Communications	24	4.13	16	4.75	22	9.28	4.75
Construction	48	8.26	45	13.35	18	7.59	9.50
Consumer	22	3.79	38	11.28	16	6.75	5.95
Environment	5	.86	9	2.67	11	4.64	1.66
Entertainment	7	1.20	14	4.15	11	4.64	2.26
Health	89	15.32	21	6.23	10	4.22	12.02
Hospitality	9	1.55	10	2.97	9	3.80	2.11
Manufacturing	13	2.24	9	2.67	13	5.49	2.64
Personal Service	15	2.58	17	5.04	14	5.91	3.50
Public Service	91	15.66	36	10.68	29	12.24	14.09
Transportation	23	3.96	18	5.34	24	10.13	4.86
Sales and Marketing	37	6.37	31	9.20	25	10.55	7.46
Other	1	.17	0	.00	0	.00	.11
TOTAL	581	100.00	337	100.00	237	100.00	100.00

The column entitle "Sample PCT" indicates the percentage of the total sample having an interest in each job group. Percentages in this column do not differentiate between levels of interest. However, the column entitled "Weight PCT" exhibits weighted percentage for each job group having taken into consideration varying levels of interest. The "Weight PCT" is calculated similar to that calculation described for Table 8 (see Exhibit 43).

TABLE 14. JOB GROUP FOR WHICH TRAINING IS WANTED (POPULATION INFORMATION)

Exhibited in this table (see Exhibit 49) is an estimate of the number of individuals in the total population who would fall under each of the three levels of choice.

EXHIBIT 49

SUMMARY TABLE ON GENERAL PROGRAM INTEREST
FOR JOB TRAINING FOR POPULATION

Table 14

JOB GROUP	POPULATION ESTIMATE FIRST CHOICE	POPULATION ESTIMATE SECOND CHOICE	POPULATION ESTIMATE THIRD CHOICE
Agriculture	1,748	372	254
Office and Accounting	2,121	1,060	431
Communications	472	313	431
Construction	942	883	354
Consumer Homemaking	431	747	313
Enviornment	97	177	215
Entertainment	138	274	215
Health	1,748	413	195
Hospitality	177	195	177
Manufacturing	254	177	254
Personal Service	295	333	274
Public Service	1,787	706	569
Transportation	451	354	472
Sales and Marketing	726	608	490
Other	20	0	0
TOTAL	11,407	6,612	4,644

TABLE 15. JOBS FOR WHICH TRAINING IS WANTED

The specific jobs for which training is desired in each job group are shown in this table (see Exhibit 50). The number in the sample and the related percentages are reported for each major occupational category, but only the number in the sample is reported for specific occupations within major occupational categories. The percentage in the "Percent of Reported" column are based only on those responding to this item on the questionnaire.

TABLE 16. NEED FOR MORE EDUCATION

Table 16 (see Exhibit 51) summarizes the total interest in more education, combining the interest in more education for hobbies and special interests as well as for job training. Respondents are counted only once in this summary table even if they responded to both the sections on interest in hobbies and special interest and in job training. Information is presented for number of respondents indicating either or both types of interest, the percentage in each category and an estimate for the population.

TABLE 17. TIME WHEN MORE EDUCATION COULD BE ATTENDED

This table (see Exhibit 52) summarizes the times when respondents can be available for more education. For each time or time combination, the number in the sample for whom this time is convenient is indicated together with the related percentage and population estimate. Population estimates are based on the estimated number of the population who would respond "yes" to interest in more education as shown in Table 16.

TABLE 18. HINDRANCES TO ATTENDING EDUCATIONAL PROGRAMS

From the listed nine hindrances to attending educational programs, the respondents were requested to check as many as

EXHIBIT 50

SUMMARY TABLE OF SPECIFIC JOBS OF INTEREST FOR MORE JOB TRAINING

Table 15

OCCUPATION	NUMBER IN SAMPLE	PERCENT OF REPORTED
Professional, Technical, and Kindred Workers	188	44.34
Accountants	22	
Computer Programmers	2	
Computer Systems Analysts	1	
Electrical and Electronic Engineers	2	
Industrial Engineers	2	
Engineers, N.E.C.	1	
Foresters and Conservationists	1	
Lawyers	4	
Librarians	1	
Biological Scientists	1	
Chemists	1	
Personnel and Labor Relations Workers	2	
Pharmacists	1	
Physicians, Medical and Osteopathic	17	
Veterinarians	1	
Dietitians	2	
Registered Nurses	16	
Therapists	4	
Clinical Laboratory Technologists & Technicians	3	
Dental Hygienists	2	
Radiologic Technologists and Technicians	1	
Health Technologists and Technicians, N.E.C.	1	
Clergymen	1	
Economists	1	
Sociologists	1	
Social Workers	13	
Recreation Workers	2	
Mathematics Teachers	2	
Psychology Teachers	1	
Art, Drama, & Music Teachers	1	
Education Teachers	1	
Trade, Industrial, and Technical Teachers	2	
Teachers, College & University Subject Not Spec.	7	
Adult Education Teachers	5	
Elementary School Teachers	7	
Prekindergarten & Kindergarten Teachers	3	
Secondary School Teachers	2	
Teachers, except College & University, N.E.C.	17	
Draftsmen	3	
Electrical & Electronic Engineering Technicians	1	
Mechanical Engineering Technicians	1	
Engineering & Science Technicians, N.E.C.	2	
Vocational & Educational Counselors	2	

EXHIBIT 50 (CONTINUED)

OCCUPATION	NUMBER IN SAMPLE	PERCENT OF REPORTED
Professional, Technical, and Kindred Workers (continued)		
Actors	2	
Authors	1	
Designers	4	
Editors & Reporters	4	
Musicians & Composers	1	
Painters & Sculptors	4	
Photographers	3	
Public Relations Men & Publicity Writers	2	
Writers, Artists, & Entertainers, N.E.C.	1	
Research Workers, Not Specified	3	
Managers and Administrators, Except Farm	38	8.96
Bank Officers & Financial Managers	5	
Buyers & Shippers, Farm Products	2	
Health Administrators	4	
Office Managers, N.E.C.	2	
Postmasters & Mail Superintendents	1	
Purchasing Agents & Buyers, N.E.C.	1	
Restaurants, Cafeteria, & Bar Managers	1	
Sales Managers & Department Heads, Retail Trade	1	
Managers & Administrators, N.E.C.	21	
Sales Workers	13	3.07
Advertising Agents & Salesmen	1	
Insurance Agents, Brokers, & Underwriters	2	
Real Estate Agents & Brokers	2	
Stock & Bond Salesmen	1	
Salesmen & Sales Clerks, N.E.C.	7	
Clerical and Kindred Workers	46	10.85
Bookkeepers	11	
Counter Clerks, except Food	1	
Key Punch Operators	1	
Receptionists	1	
Secretaries, Legal	1	
Secretaries, Medical	1	
Secretaries, N.E.C.	18	
Shipping & Receiving Clerks	4	
Teacher Aides, exc. School Monitors	1	
Telephone Operators	5	
Typists	1	
Not Specified Clerical Workers	1	
Craftsmen and Kindred Workers	55	12.97
Carpenters	15	

EXHIBIT 50 (CONTINUED)

OCCUPATION	NUMBER IN SAMPLE		PERCENT OF REPORTED
Craftsmen and Kindred Workers (continued)			
Decorators & Window Dressers		2	
Electricians		7	
Locomotive Engineers		1	
Air Conditioning, Heating, & Regrigeration Mech		1	
Automobile Body Repairmen		4	
Automobile Mechanics		8	
Farm Implement Mechanics		1	
Heavy Equipment Mechanics, incl. Diesel		8	
Household Appliance-Accessory Installers, Mechanic		2	
Radio & Television Repairmen		1	
Not Specified Mechanics & Repairmen		1	
Plumbers & Pipe Fitters		2	
Sign Painters & Letters		1	
Telephone Installers & Repairmen		1	
Operatives, Except Transport	8		1.89
Assemblers		1	
Dressmakers & Seamstresses, except Factory		3	
Photographic Process Workers		2	
Stationary Firemen		2	
Transportation Equipment Operatives	2		.47
Motormen; Mine, Factory, Logging Camp, etc.		1	
Truck Drivers		1	
Laborers, except Farm	2		.47
Construction Laborers, except Carpenters' Helpers		1	
Longshoremen & Stevedores		1	
Farmers and Farm Managers	29		6.84
Farmers (owners & tenants)		27	
Farm Managers		2	
Farm Laborers and Farm Foremen	2		.47
Farm Laborers, Unpaid Family Workers		2	
Service Workers, except Private Household	39		9.20
Cooks, except Private Household		1	
Waiters		1	
Food Service Worker, N.E.C., except Private Household		1	
Dental Assistants		4	
Nursing Aides, Orderlies, & Attendants		2	
Practical Nurses		15	
Child Care Workers, except Private Household		1	
Hairdressers & Cosmetologists		3	

EXHIBIT 50 (CONTINUED)

OCCUPATION	NUMBER IN SAMPLE	PERCENT OF REPORTED
Service Workers, except Private Households (continued)		
Housekeepers, except Private Households.	2	
Welfare Service Aids	7	
Policemen & Detectives	2	
Private Household Workers	2	.47
Child Care Workers, Private Household.	1	
Cooks, Private Household	1	
TOTAL	424	100.00

EXHIBIT 51

SUMMARY TABLE ON INTEREST IN MORE EDUCATION

Table 16

NEED FOR MORE EDUCATION	NUMBER IN SAMPLE	PERCENT	POPULATION ESTIMATE
Yes	1,085	18.46	21,323
No	4,793[a]	81.54	94,186
TOTAL	5,878	100.00	115,509

[a] This is an estimate based on the assumption that all persons in the sample who did not respond to the assessment questionnaire did not want more education for hobbies and special interest or job training, and an assumption that there was an average of 1.6 persons per household over 18 years of age in the West Central Development Region.

EXHIBIT 52

SUMMARY TABLE ON WHEN MORE EDUCATION COULD BE ATTENDED

Table 17

TIME	NUMBER IN SAMPLE	PERCENT	POPULATION ESTIMATE
Weekend	39	4.79	766
Night	395	48.47	7,762
Night or Weekend	118	14.48	2,320
Day	132	16.20	2,594
Day or Weekend	5	.61	99
Day or Night	94	11.53	1,847
Day or Night or Weekend	32	3.93	629
TOTAL	815	100.00	16,017

apply to their situation. In this table (see Exhibit 53), the number of times each hindrance is checked is indicated together with the related percentage and population estimate. The percentages are based on the total number of respondents indicating at least one hindrance to attending more educational programs. Population estimates are based on the population estimate for the "yes" category in Table 16.

EXHIBIT 53

SUMMARY TABLE ON HINDRANCES TO ATTENDING MORE EDUCATION

Table 18

HINDRANCES	NUMBER IN SAMPLE	PERCENT	POPULATION ESTIMATE
Distance (too far)	346	32.67	1,256
Inconvenient Time	284	26.82	1,032
Requirements Too High	39	3.68	143
Cost Too High	192	18.13	697
Requirements of Job	386	36.45	1,400
Family Obligations	307	28.99	1,115
Stable Income	129	12.19	469
Lack of Transportation	44	4.16	160
Not Informed	155	14.04	563
Other	138	13.04	501
TOTAL	1,059[a]		7,336

[a] This sum represents the number of respondents. It is not the sum of the column since multiple responses were accepted.

TABLE 19. DISTANCE WILLING TO TRAVEL FOR THOSE WITH TRANSPORTATION HINDRANCE

This table (see Exhibit 54) has five distance categories which summarizes the distances respondents are willing to travel

EXHIBIT 54

SUMMARY TABLE ON DISTANCE WILLING TO TRAVEL
FOR THOSE WITH A TRANSPORTATION HINDRANCE

Table 19

DISTANCE	NUMBER IN SAMPLE	PERCENT
1 - 10 miles	45	18.75
11 - 20 miles	82	34.17
21 - 30 miles	56	23.33
31 - 40 miles	20	8.33
Over 40 miles	37	15.42
TOTAL	240	100.00

to participate in an educational program. For each distance category, the number of persons in the sample willing to travel that distance together with the related percentage of total responses is provided.

TABLE 20. HELP NEEDED TO DETERMINE EDUCATIONAL NEED

Respondents were asked to indicate on the questionnaire whether they need help in determining their educational need. The number of respondents in the sample and the related percentages and population estimates are shown for the "yes" and "no" responses in Table 20 (see Exhibit 55). The population estimate assumes that individuals not returning a questionnaire and those not completing this item would respond "no".

EXHIBIT 55

SUMMARY TABLE ON NEED FOR HELP
TO DETERMINE EDUCATIONAL NEED

Table 20

NEED	NUMBER IN SAMPLE	PERCENT	POPULATION ESTIMATE
Yes	235	4.00	4,620
No	5,643[a]	96.00	110,889
TOTAL	5,878	100.00	115,509

[a] This is an estimate based on the assumption that all persons in the sample who did not respond to the assessment questionnaire did not want help to determine educational need and an assumption that there was an average of 1.6 persons per household over 18 years of age in the West Central Region.

SUMMARY

The set of summary tables used to describe the results of using the proposed sample questionnaire have been presented and explained. The tables are designed to answer the key questions posed in Chapter 1 of this report. Note that the set of summary tables can be provided for the total group of respondents in the study as well as various sub-groups of the population which may be of particular interest.

CHAPTER VI

PROCEDURE SUMMARY

The purpose of this handbook, as stated in Chapter I, was to document a procedure for obtaining information about the interest of people for additional job training. The procedure, as documented, will result in the acquisition of a set of tables (similar to those exhibited in Chapter V). These tables are designed to provide information so as to allow specification and communication of interest in job training for the purpose of planning educational programs. The purpose of this last chapter is to briefly summarize the procedure and to reiterate the key points which are critical to the assessment of needs for additional job training.

The three major concerns of the procedure are: (1) What type of information must be collected, (2) how should the information be collected, and (3) what management strategy and organization facilitate effective operation.

INFORMATION NEEDS

The information to be collected should describe the characteristics of the people to be served, and provide information pertinent to the major facets of planning job training programs. Data on age, sex, and employment status describe the sample and facilitiates comparison with the population from which the sample was derived. Although this information is an integral part of the information needed for planning programs, data which are much more pertinent to the planning process must be collected. Such data includes the number of people needing job training, the type of training needed and the reason for its need, the place and time training could be attended, and the special barriers to attendance. This information is usually of invaluable assistance in the planning and implemention of programs for which need exists, at the convenience of those in need.

DATA COLLECTION

After the type of information to be collected has been determined, the most immediate concerns are the selection of a sample of people from whom the information should be collected and the adoption of a feasible and effective method of data collection. These concerns address the core of the needs assessment procedure.

Though it may be desirable to collect information from the entire population of concern, limited time and financial resources are usually the major deterrents. As a result, a sample or part of the entire population must be selected in such a manner that the resulting information will be generalizable to the population of concern. The second chapter of this handbook summarizes acceptable sample sizes with respect to population size and desired level of accuracy. The third chapter, more specifically, outlines an effective method of identifying the names and addresses of households to be included in the sample; in effect, it details the method of sample selection. The sample selection method is a modification of the procedure outlined by the United States Census Bureau for its Current Population Survey and it requires census data concerning population and household numbers.

Having identified the sample, the next step involves contacting the households and gathering information concerning job training needs. The method of contact described in this handbook requires the use of two mailings and a telephone follow-up; a procedure which combines a high rate of return with efficient use of resources. In each mailing, a cover letter and questionnaires are enclosed. The procedure for mailing, coding, and initiating telephone contact is described in Chapter IV. The questionnaires returned by respondents are coded and prepared for data anlaysis.

MANAGEMENT STRATEGY

The variety of activities involved, in addition to the critical nature of deadlines and the importance of timely termination, make effective management compulsory for successfully coordinating the assessment activities. Critical management activities include the hiring and training of staff; securing space, equipment, and resources for the project; developing a plan of operation for the study; conducting public relations efforts; and after data analysis, writing and disseminating the assessment report. These activities are reviewed in the second chapter of this handbook.

A plan of operation contributes immensely to managerial effectiveness since critical deadlines as mailing and termination dates are always kept in focus, and the plan serves as a base for monitoring the effectiveness of the process. An effective management strategy, coupled with the collection of the right type of information from an acceptable sample of the population, is the basis of a job training needs assessment procedure which provides important data to program planners, approvers and implementers.

APPENDIX I

SAMPLE QUESTIONNAIRE

☐☐☐☐☐☐☐ (1-10)

YOUR INTEREST IN MORE EDUCATION— HOBBIES, SPECIAL INTERESTS, OR JOB TRAINING

A. What is your age?________years (11-12)

B. What is your sex?________male________female (13)

C. If you are working at present, what is your job?________________________ ☐☐☐
(For example: teacher, farmer, secretary, homemaker) (14-16)

If you are not working at present or are working less time than desired, what is the reason? Check all that apply.

________ 1. In school (17)
________ 2. Retired (18)
________ 3. Cannot find more work (19)
________ 4. Do not want more work (20)
________ 5. Other reason, explain:________________________ (21)

D. Do you want more education for hobbies or special interests for any of the following reasons? Check the one most important reason or check "do not want." ☐ (22)

________ 1. Better use of my leisure time.
________ 2. Save money by doing it myself.
________ 3. General self-improvement.
________ 4. Do not want more education for hobbies or special interests (skip question E, go to F).

E. For the reason checked in Question D above, what type of programs would you like? Indicate your first choice with a "1," your second choice with a "2," and your third choice with a "3."

________ 1. Basic skills (examples: refresher math, basic English) ☐
________ 2. Arts and crafts (examples: oil painting, art, leather tooling) (23)
________ 3. Music (examples: guitar, banjo, piano)
________ 4. Recreation (examples: camping, bridge, dancing) ☐
________ 5. Home skills (examples: quilting, flower arrangement, gourmet cooking) (24)
________ 6. Technical (examples: home remodeling, auto repair, plumbing, electrical wiring)
________ 7. Liberal (examples: history, economics, foreign language) ☐
________ 8. Other type, explain:________________________ (25)

IMPORTANT

For the choice checked "1" in Question E above, describe in detail the actual topic you had in mind. Examples: refresher math, guitar, plumbing, history.

____ ☐☐☐
(26-28)

F. Do you want more job or employment related training for any of the following reasons? Check the one most important reason or check "do not want."

________ 1. Prepare for my first job.
________ 2. Prepare for a job which is unrelated to a job I have or have had. (29)
________ 3. Prepare to re-enter a job similar to one I had in the past. ☐
________ 4. Prepare for a job promotion or advancement.
________ 5. Prepare to do better at or keep my present job.
________ 6. Prepare for certification, recertification, or licensing.
________ 7. Do not want more job or employment related training (skip Question G, go to I).

G. For the reason checked in Question F above, what are the job(s) for which you would like to better prepare? Indicate your first choice with a "1," your second choice with a "2," and your third choice with a "3."

________ 1. Agriculture (examples: farmer, tractor mechanic, feed salesperson, florist)

________ 2. Office and accounting (examples: secretary, cashier, bookkeeper, accountant, office manager)

________ 3. Communications (examples: newspaper reporter, photographer, telephone operator, radio repairperson) ☐ (30)

________ 4. Construction (examples: carpenter, electrician, painter, plumber) ☐

________ 5. Consumer homemaking (examples: homemaker, parent) (31)

________ 6. Environment (examples: water quality technician, air pollution technician, sewage plant worker) ☐ (32)

________ 7. Entertainment (examples: musician, sound and light technician, backstage hand, actor or actress)

________ 8. Health (examples: nurse, surgical technician, nursing assistant, dental laboratory technician, doctor)

________ 9. Hospitality and recreation (examples: maid or houseman, cook, waiter or waitress, dietitian, motel manager, guide, resort worker)

________ 10. Manufacturing (examples: machinist, assembler, plant manager)

________ 11. Personal service (examples: barber or cosmetologist, child care worker, tailor, seamstress)

________ 12. Public service (examples: police staff, teacher, safety inspector, social service worker)

________ 13. Transportation (examples: truck driver, auto mechanic, service station manager, stewardess, pilot)

________ 14. Sales and marketing (examples: salesperson, advertising specialist, merchant, appraiser)

________ 15. Other, explain: ________________________________

IMPORTANT

For the group of jobs checked "1" in Question G, describe in detail the actual job you had in mind for which more training is desired. Examples: secretary, carpenter, farmer, registered nurse.

____ ☐☐☐

____ (33-35)

H. When could you attend an educational program? Check as many as you can.

________ 1. Day (Monday-Friday) (36)

________ 2. Night (Monday-Friday) (37)

________ 3. Weekends (38)

I. What are some of the most serious problems that may prevent you from attending an educational program? Check all that usually apply to you.

________ 1. Program not available in local area. (39)
How far would you travel? ________ miles (40-42)

________ 2. Program not available at convenient time. (43)

________ 3. Could not meet admission requirements. (44)

________ 4. Costs of attending are too high. (45)

________ 5. Present job does not allow time. (46)

________ 6. Family obligations (e.g., child care) do not allow time. (47)

________ 7. More training would not raise my income. (48)

________ 8. Have no transportation. (49)

________ 9 I never hear about programs being offered and I don't know where to find out. (50)

________ 10. Other, explain: ________________________________ (51)

____

J. Would you like help in deciding what type of further education or job training you need? (52)

________ yes ________ no

Thank you for your responses. Did other members of your household fill out their form? Please fold and return all the forms from your household in the enclosed envelope. No postage is required.

APPENDIX II

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APPENDIX III

USING RANDOM NUMBERS TABLE

USING RANDOM NUMBERS TABLE

The random number table is one method of choosing a simple random sample. For the purpose of this handbook, it enables one to choose a desired portion of the population of sampling segments in such a manner that each sampling segment has an equal probability of being chosen.

In order to use these tables for random sampling, list all the sampling segments in the Enumeration District from which the sample will be chosen. Each sampling segment is numbered in consecutive order starting with the number "1". The table of random numbers is entered by choosing some starting point at random and reading to the right or left, up or down. If the Enumeration District contains only nine or fewer sampling segments, then the single digits "1" through "9" are used; if there are 99 or fewer sampling segments in the ED, digits are grouped by pairs, "01" through "99", and so on. Then the first "N" non-repeated random numbers or groups of numbers are chosen, where "N" is the required sample size. The individual units or sampling segments corresponding to these numbers comprise the sample, which can be regarded as chosen at random.

AN ILLUSTRATION

In this illustration, a simple random sample of 10 sampling segments (SS) must be chosen from an ED with 25 sampling segments. The steps are as follows: (a) Number the 25 units in the ED (population) serially, in any order. Each serial number should have as many digits as the number of digits in the population. For example, with 25 SS in the population, the required number of digits is 2, and the first unit is assigned the number 01; the second, 02; the fifteenth, 15; and 25 for the last one; (b) select a page from the table of random numbers. As the numbers are random, any arbitrary selection of a page will do, just so that one does not always begin at the same page and does not permit the number on the page to influence the selection of the page. In practice, one may well begin on the first page of random numbers, mark lightly in pencil the last number used on a page and proceed onward from that point when the next random number is needed; and (c) on the selected page of random numbers use a vertical guide to demarcate the required number of columns of digits. Thus, if the ED has 25 SS, 2 columns will be needed. In the random number table that follows, the first four random numbers of two digits are 39, 73, 72, 75. Move the eye downward on these two columns until a number less than 25 is encountered. All others are counted as blanks. The first number less than 25 is 02; the SS which was coded "02" is the first SS to be drawn into the sample. For the second item, we proceed onward -- 87, 98, 10; since 10 is less than 25, the SS which was coded "10" is the second SS to be drawn into the sample. The numbers 87 and 98 are to be ignored since they are larger than 25, the size of the population. As no SS may be drawn twice, duplicate random numbers are to be counted as blanks.

If the bottom of the column is arrived at before selecting the required sample, the next two columns can be demarcated and used. The second column would yield 65, 71, 20, etc. Proceed in this manner through successive columns until the required number of sampling segments to be included in the sample is selected.

The serial numbers of the 10 sampling segments to be drawn from the ED in this illustration for inclusion in the random sample are as follows: 02, 10, 21, 22, 19, 16, 03, 04, 23, and 15. Since 10 numbers below 25 were obtained from the first column, it was not necessary to use a second column of 2 digits.

39 65 76 45 45	19 90 69 64 61	20 26 36 31 62	53 24 97 14 97	95 06 70 99 00
73 71 23 70 90	65 97 60 12 11	31 56 34 19 19	47 83 75 51 33	30 62 38 20 46
72 20 47 33 84	51 67 47 97 19	98 40 07 17 66	23 05 09 51 80	59 78 11 52 49
75 17 25 69 17	17 95 21 78 58	24 33 45 77 48	69 81 84 09 29	93 22 70 45 80
37 48 79 88 74	63 52 06 34 30	01 31 60 10 27	35 07 79 71 53	28 99 52 01 41
02 89 08 16 94	85 53 83 29 95	56 27 09 24 43	21 73 53 09 82	72 61 88 73 61
87 18 15 70 07	37 79 49 12 38	48 13 93 55 96	41 92 45 71 51	09 18 25 58 94
98 83 71 70 15	89 09 39 59 24	00 06 41 41 20	14 36 59 25 47	54 45 17 24 89
10 08 58 07 04	76 62 16 48 68	58 76 17 14 86	59 53 11 52 21	66 04 18 72 87
47 90 56 37 31	71 82 13 50 41	27 55 10 24 92	28 04 67 53 44	95 23 00 84 47
93 05 31 03 07	34 18 04 52 35	74 13 39 35 22	68 95 23 92 35	36 63 70 35 33
21 89 11 47 99	11 20 99 45 18	76 51 94 84 86	13 79 93 37 55	98 16 04 41 67
95 18 94 06 97	27 37 83 28 71	79 57 95 13 91	09 61 87 25 21	56 20 11 32 44
97 08 31 55 73	10 65 81 92 59	77 31 61 95 46	20 44 90 32 64	26 99 76 75 63
69 26 88 86 13	59 71 74 17 32	48 38 75 93 29	73 37 32 04 05	60 82 29 20 25
41 47 10 25 03	87 63 93 95 17	81 83 83 04 49	77 45 85 50 51	79 88 01 97 30
91 94 14 63 62	08 61 74 51 69	92 79 43 89 79	29 18 94 51 23	14 85 11 47 23
80 06 54 18 47	08 52 85 08 40	48 40 35 94 22	72 65 71 08 86	50 03 42 99 36
67 72 77 63 99	89 85 84 46 06	64 71 06 21 66	89 37 20 70 01	61 65 70 22 12
59 40 24 13 75	42 29 72 23 19	06 94 76 10 08	81 30 15 39 14	81 83 17 16 33
63 62 06 34 41	79 53 36 02 95	94 61 09 43 62	20 21 14 68 86	84 95 48 46 45
78 47 23 53 90	79 93 96 38 63	34 85 52 05 09	85 43 01 72 73	14 93 87 81 40
87 68 62 15 43	97 48 72 66 48	53 16 71 13 81	59 97 50 99 52	24 62 20 42 31
47 60 92 10 77	26 97 05 73 51	88 46 38 03 58	72 63 49 29 31	75 70 16 08 24
56 88 87 59 41	06 87 37 78 48	65 88 69 58 39	88 02 84 27 83	85 81 56 39 38
22 17 68 65 84	87 02 22 57 51	68 69 80 95 44	11 29 01 95 80	49 34 35 86 47
19 36 27 59 46	39 77 32 77 09	79 57 92 36 59	89 74 39 82 15	08 58 94 34 74
16 77 23 02 77	28 06 24 25 93	22 45 44 84 11	87 80 61 65 31	09 71 91 74 25
78 43 76 71 61	97 67 63 99 61	80 45 67 93 82	59 73 19 85 23	53 33 65 97 21
03 28 28 26 08	69 30 16 09 05	53 58 47 70 93	66 56 45 65 79	45 56 20 19 47
04 31 17 21 56	33 73 99 19 87	26 72 39 27 67	53 77 57 68 93	60 61 97 22 61
61 06 98 03 91	87 14 77 43 96	43 00 65 98 50	45 60 33 01 07	98 99 46 50 47
23 68 35 26 00	99 53 93 61 28	52 70 05 48 34	56 65 05 61 86	90 92 10 70 80
15 39 25 70 99	93 86 52 77 65	15 33 59 05 28	22 87 26 07 47	86 96 98 29 06
58 71 96 30 24	18 46 23 34 27	85 13 99 24 44	49 18 09 79 49	74 16 32 23 02
93 22 53 64 39	07 10 63 76 35	87 03 04 79 88	08 13 13 85 51	55 34 57 72 69
78 76 58 54 74	92 38 70 96 92	52 06 79 79 45	82 63 18 27 44	69 66 92 19 09
61 81 31 96 82	00 57 25 60 59	46 72 60 13 77	55 66 12 62 11	08 99 55 64 57
42 88 07 10 05	24 98 65 63 21	47 21 61 88 32	27 80 30 21 60	10 92 35 36 12
77 94 30 05 39	28 10 99 00 27	12 73 73 99 12	49 99 57 94 82	96 88 57 17 91

Source: Wonnacott, Thomas H., and Wonnacott, Ronald J., Introductory Statistics. John Wiley and Sons, Inc., New York, 1969.

APPENDIX IV

SAMPLE COMPUTER OUTPUT ON SAMPLING SEGMENTS

REGION 4

COUNTY NAME	ED NO.	AREA NAME	TOTAL POP	TOTAL HSG	NO. SAMPLING SEGMENTS	CUM. NO. SAMPLING SEGMENTS	NO. OF RANDOM NUMBERS	RANDOM SAMPLING NUMBERS				
DOUGLAS	0025	ALEXANDRIA TWP	1692	724	121	1- 121	6	3	23	43	63	83
								103				
OTTER TAIL	0070	FERGUS FALLS	1543	648	108	122- 229	6	123	143	163	183	203
								223				
OTTER TAIL	0009	DUNN TWP	100	545	91	230- 320	4	243	263	283	303	
CLAY	0040	MOORHEAD	1732	519	87	321- 407	5	323	343	363	383	403
CLAY	0068	BARNESVILLE	1509	516	86	408- 493	4	423	443	463	483	
CLAY	0016	HAWLEY	1371	489	82	494- 575	4	503	523	543	563	
CLAY	0034	MOORHEAD	1044	471	79	576- 654	4	583	603	623	643	
POPE	0013	STARBUCK	1138	466	78	655- 732	4	663	683	703	723	
CLAY	0043	MOORHEAD	1549	465	78	733- 810	4	743	763	783	803	
BECKER	0057	LAKE VIEW TWP	287	464	77	811- 887	4	823	843	863	883	
STEVENS	0010	MORRIS	1149	445	74	888- 961	3	903	923	943		
CLAY	0024	MOORHEAD	1738	442	74	962- 1035	4	963	983	1003	1023	
CLAY	0029	MOORHEAD	1004	433	72	1036- 1107	4	1043	1063	1083	1103	
CLAY	0025	MOORHEAD	1025	421	70	1108- 1177	3	1123	1143	1163		
STEVENS	0014	MORRIS	1215	412	69	1178- 1246	4	1183	1203	1223	1243	
CLAY	0047	DILWORTH	1417	406	68	1247- 1314	3	1263	1283	1303		
POPE	0020	GLENWOOD TWP	732	406	68	1315- 1382	3	1323	1343	1363		
BECKER	0034	DETROIT LAKES	1122	405	68	1383- 1450	4	1383	1403	1423	1443	
OTTER TAIL	0024	PERHAM	1208	403	67	1451- 1517	3	1463	1483	1503		
POPE	0017	GLENWOOD	1037	403	67	1518- 1584	4	1523	1543	1563	1583	
OTTER TAIL	0018	LIDA TWP	205	402	67	1585- 1651	3	1603	1623	1643		
OTTER TAIL	0071	FERGUS FALLS	1708	401	67	1652- 1718	3	1663	1683	1703		
CLAY	0037	MOORHEAD	2791	400	67	1719- 1785	4	1723	1743	1763	1783	
OTTER TAIL	0072	FERGUS FALLS	1184	393	66	1786- 1851	3	1803	1823	1843		
STEVENS	0012	MORRIS	1112	392	65	1852- 1916	3	1863	1883	1903		
OTTER TAIL	0080	FERGUS FALLS	1439	385	64	1917- 1980	3	1923	1943	1963		
BECKER	0054	LAKE VIEW TWP	690	382	64	1981- 2044	4	1983	2003	2023	2043	
BECKER	0032	DETROIT LAKES	723	381	64	2045- 2108	3	2063	2083	2103		
BECKER	0053	FRAZEE	1015	376	63	2109- 2171	3	2123	2143	2163		
BECKER	0061	LAKE EUNICE TWP	289	376	63	2172- 2234	3	2183	2203	2223		
TRAVERSE	0009	WHEATON	894	369	62	2235- 2296	3	2243	2263	2283		
BECKER	0023	DETROIT TWP	524	365	61	2297- 2357	3	2303	2323	2343		
DOUGLAS	0036	ALEXANDRIA	1069	361	60	2358- 2417	3	2363	2383	2403		
BECKER	0031	DETROIT LAKES	1146	359	60	2418- 2477	3	2423	2443	2463		
OTTER TAIL	0015	PELICAN RAPIDS	1010	358	60	2478- 2537	3	2483	2503	2523		
WILKIN	0027	BRECKENRIDGE	1212	355	59	2538- 2596	3	2543	2563	2583		
OTTER TAIL	0059	HENNING	850	352	59	2597- 2655	3	2603	2623	2643		
POPE	0018	GLENWOOD	1034	351	59	2656- 2714	3	2663	2683	2703		
DOUGLAS	0014	IDA TWP	490	349	58	2715- 2772	3	2723	2743	2763		
OTTER TAIL	0069	FERGUS FALLS	1086	349	58	2773- 2830	3	2783	2803	2823		
DOUGLAS	0037	LA GRAND TWP	794	345	58	2831- 2888	3	2843	2863	2883		
OTTER TAIL	0096	PARKERS PRAIRIE	882	345	58	2889- 2946	3	2903	2923	2943		
OTTER TAIL	0062	EVERTS TWP	242	343	57	2947- 3003	3	2963	2983	3003		
BECKER	0033	DETROIT LAKES	913	342	57	3004- 3060	2	3023	3043			
TRAVERSE	0021	BROWNS VALLEY	906	342	57	3061- 3117	3	3063	3083	3103		
OTTER TAIL	0073	FERGUS FALLS	923	340	57	3118- 3174	3	3123	3143	3163		
STEVENS	0013	MORRIS	955	338	56	3175- 3230	3	3183	3203	3223		
OTTER TAIL	0049	AMOR TWP	259	333	56	3231- 3286	3	3243	3263	3283		
OTTER TAIL	0012	SCAMBLER TWP	323	333	56	3287- 3342	2	3303	3323			

REGION 4

COUNTY NAME	ED NO.	AREA NAME	TOTAL POP	TOTAL HSG	NO. SAMPLING SEGMENTS	CUM. NO. SAMPLING SEGMENTS	NO. OF RANDOM NUMBERS	RANDOM SAMPLING NUMBERS		
OTTER TAIL	0019	DORA TWP	370	331	55	3343- 3397	3	3343	3363	3383
OTTER TAIL	0075	FERGUS FALLS	956	325	54	3398- 3451	3	3403	3423	3443
BECKER	0063	CORMORANT TWP	143	323	54	3452- 3505	3	3463	3483	3503
OTTER TAIL	0065	DANE PRAIRIE TWP	562	323	54	3506- 3559	2	3523	3543	
CLAY	0039B	MOORHEAD	1085	321	54	3560- 3613	3	3563	3583	3603
GRANT	0010	ELBOW LAKE	988	318	53	3614- 3666	3	3623	3643	3663
DOUGLAS	0026	ALEXANDRIA	758	312	52	3667- 3718	2	3683	3703	
OTTER TAIL	0064	BATTLE LAKE	772	307	51	3719- 3769	3	3723	3743	3763
DOUGLAS	0016	CARLOS TWP	572	306	51	3770- 3820	2	3783	3803	
BECKER	0026	DETROIT TWP	1027	305	51	3821- 3871	3	3823	3843	3863
CLAY	0043B	MOORHEAD	914	305	51	3872- 3922	2	3883	3903	
CLAY	0038B	MOORHEAD	2015	302	50	3923- 3972	3	3923	3943	3963
OTTER TAIL	0005	HOBART TWP	472	302	50	3973- 4022	2	3983	4003	
OTTER TAIL	0016	PELICAN RAPIDS	625	300	50	4023- 4072	3	4023	4043	4063
BECKER	0060	LAKE EUNICE TWP	331	299	50	4073- 4122	2	4083	4103	
OTTER TAIL	0031	NEW YORK MILLS	791	299	50	4123- 4172	3	4123	4143	4163
DOUGLAS	0034	ALEXANDRIA	826	298	50	4173- 4222	2	4183	4203	
OTTER TAIL	0079	FERGUS FALLS	716	297	50	4223- 4272	3	4223	4243	4263
OTTER TAIL	0061	GIRARD TWP	193	296	49	4273- 4321	2	4283	4303	
WILKIN	0024	BRECKENRIDGE	950	296	49	4322- 4370	3	4323	4343	4363
CLAY	0033	MOORHEAD	778	295	49	4371- 4419	2	4383	4403	
CLAY	0046	MOORHEAD	694	295	49	4420- 4468	3	4423	4443	4463
DOUGLAS	0028	ALEXANDRIA	670	294	49	4469- 4517	2	4483	4503	
OTTER TAIL	0047	MAINE TWP	434	291	49	4518- 4566	3	4523	4543	4563
DOUGLAS	0035	ALEXANDRIA	688	288	48	4567- 4614	2	4583	4603	
POPE	0004	LEVEN TWP	460	288	48	4615- 4662	2	4623	4643	
CLAY	0041	MOORHEAD	931	286	48	4663- 4710	3	4663	4683	4703
STEVENS	0018	HANCOCK	806	286	48	4711- 4758	2	4723	4743	
OTTER TAIL	0074	FERGUS FALLS	639	285	48	4759- 4806	3	4763	4783	4803
OTTER TAIL	0023	PERHAM	725	284	47	4807- 4853	2	4823	4843	
OTTER TAIL	0020	EDNA TWP	469	281	47	4854- 4900	2	4863	4883	
TRAVERSE	0010	WHEATON	714	281	47	4901- 4947	3	4903	4923	4943
CLAY	0028	MOORHEAD	1000	278	46	4948- 4993	2	4963	4983	
CLAY	0045B	MOORHEAD	877	276	46	4994- 5039	2	5003	5023	
CLAY	0020	OAKPORT TWP	1041	274	46	5040- 5085	3	5043	5063	5083
OTTER TAIL	0065	SVERDRUP TWP	498	272	45	5086- 5130	2	5103	5123	
BECKER	0062	CORMORANT TWP	216	269	45	5131- 5175	2	5143	5163	
GRANT	0020	HERMAN	619	267	45	5176- 5220	2	5183	5203	
BECKER	0007	MAPLE GROVE TWP	269	266	44	5221- 5264	3	5223	5243	5263
DOUGLAS	0027	ALEXANDRIA	643	261	44	5265- 5308	2	5283	5303	
OTTER TAIL	0076	FERGUS FALLS	800	259	43	5309- 5351	2	5323	5343	
OTTER TAIL	0034	RUSH LAKE TWP	313	259	43	5352- 5394	2	5363	5383	
WILKIN	0026	BRECKENRIDGE	575	259	43	5395- 5437	2	5403	5423	
DOUGLAS	0020	OSAKIS	735	257	43	5438- 5480	2	5443	5463	
OTTER TAIL	0067	AURDAL TWP	795	257	43	5481- 5523	3	5483	5503	5523
BECKER	0017	LAKE PARK	658	254	42	5524- 5565	2	5543	5563	
DOUGLAS	0038	LA GRAND TWP	808	254	42	5566- 5607	2	5583	5603	
OTTER TAIL	0068	FERGUS FALLS	865	250	42	5608- 5649	2	5623	5643	
CLAY	0026	MOORHEAD	755	248	41	5650- 5690	2	5663	5683	
GRANT	0011	ELBOW LAKE	496	247	41	5691- 5731	2	5703	5723	
OTTER TAIL	0025	PINE LAKE TWP	294	247	41	5732- 5772	2	5743	5763	

APPENDIX V

RELIABILITY OF POPULATION ESTIMATES

CE 009 451

Standard error is a measure of the variation in estimates resulting from sampling rather than asking the whole population. The chances are 68 out of 100 that error due to sampling (difference between the estimate based on the sample and the true population value) is less than the standard error. For example, if the estimate is 200 persons and the standard error is 10, then the chances are 68 out of 100 that the difference between the estimated based on the sample and the true population value is less than 10. The chances are 95 out of 100 that the difference is less than twice the standard error (20 in the previous example) and about 99 out of 100 that it is less than 2 1/2 times the standard error (25 in the previous example).

It would be too costly to prepare estimates of standard error for each of the estimates made in the following tables. Rather, a table which should be interpreted as providing an indication of the magnitude of the standard errors rather than a precise standard error for any specific item is presented. The reliability of an estimated number depends on the size of the estimate, size of the population, and size of sample. In this study, the population was approximately 115,500 persons for residents over high school age (households) and 4,000 for high school seniors. The standard error associated with various size estimates for this population is shown in the table below. These estimates assume that a simple random sample of the population was made in order to obtain the estimates.

STANDARD ERROR OF POPULATION ESTIMATES

	Standard Error	
Size of Estimate	Households	High School Seniors
20	19	11
50	31	17
100	44	24
250	69	37
500	97	50
750	119	60
1,000	137	66
1,500	168	74
2,000	194	76
3,000	236	54
4,000	271	--
5,000	302	--
7,500	366	--
10,000	417	--
15,000	499	--
20,000	561	--